

INSTALLATION MANUAL

SUNLINE™ GAS/ELECTRIC SINGLE PACKAGE AIR CONDITIONERS

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NOTES, CAUTIONS AND WARNINGS

The installer should pay particular attention to the words: **NOTE**, **CAUTION**, and **WARNING**. **Notes** are intended to clarify or make the installation easier. **Cautions** are given to prevent equipment damage. **Warnings** are given to alert installer that personal injury and/or equipment damage may result if installation procedure is not handled properly.

**CAUTION: READ ALL SAFETY GUIDES BEFORE YOU
BEGIN TO INSTALL YOUR UNIT.**

SAVE THIS MANUAL

**DM 036, 048, 060 & 072
DF 036, 048, 060 & 072
DH 036, 048 & 060**

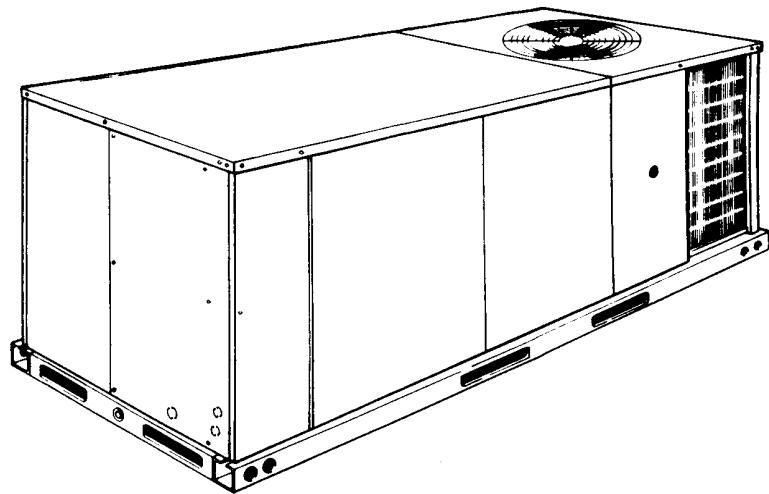


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GENERAL

YORK Model DM, DF and DH units are either single package cooling units equipped with optional factory installed electric heaters, or single package gas-fired central heating furnaces with cooling unit. Both are designed for outdoor installation on a rooftop or slab.

The units are completely assembled on rigid, permanently attached base rails. All piping, refrigerant charge, and electrical wiring is factory installed and tested. The units require electric power, gas connection, duct connections, installation of combustion air inlet hood, flue gas outlet hoods and fixed outdoor air intake damper (units without economizer or motorized damper option only) at the point of installation.

The supplemental electric heaters have nickel-chrome elements and utilize single point power connection.

The gas-fired heaters have aluminized-steel (or optional stainless steel) tubular heat exchangers. The units have spark ignition with proven pilot. All gas heaters are shipped from the factory equipped for natural gas use, but can be field converted to L.P./ Propane with Kit Model # 1NP0440.

SAFETY CONSIDERATIONS

Due to system pressure, moving parts and electrical components, installation and servicing of air conditioning equipment can be hazardous. Only qualified, trained, service personnel should install, repair, maintain or service this equipment.

Observe all precautions in the literature, on labels and tags accompanying the equipment whenever working on air conditioning equipment. Be sure to follow all other safety precautions that apply.

Wear safety glasses and work gloves, and follow all safety codes. Use a quenching cloth and have a fire extinguisher available for all brazing operations.

WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in serious injury, death, or property damage.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

- WHAT TO DO IF YOU SMELL GAS:

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Leave the building immediately.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach the gas supplier, call the fire department.

- Installation and service must be performed by a qualified installer, service agency or the gas supplier.

INSPECTION

As soon as a unit is received, it should be inspected for possible damage during transit. If damage is evident, the extent of the damage should be noted on the carrier's freight bill. A separate request for inspection by the carrier's agent should be made in writing. Refer to Form 50.15-NM for additional information.

REFERENCE

Additional information on the design, installation, operation and service of this equipment is available in the following reference forms:

- 035-19310-002 -General Installation
- 035-19404-000 -Economizer Accessory
- 530.18-N1.13V -Man. Outdoor Air Damper Accessory 0 - 35%
- 530.18-N1.14V -Man. Outdoor Air Damper Accy 0 - 100%
- 035-07364-000 -Motorized Outdoor Air Damper Accy.
- 035-11372-000 -Low NOx Accessory
- 530.46-N1.27V -High Altitude Accy. (Natural Gas)
- 530.46-N1.28V -High Altitude Accy. (Propane)
- 035-12566-000 -Gas Piping Accessory
- 530.46-N1.29V -Propane Conversion Accessory
- 035-19422-000 –Electric Heat Accessory
- 035-19405-000 -Barometric Relief Damper
- 530.46-N1.1V -Dual Enthalpy Accessory
- 530.18-N1.10V -Power Exhaust Accessory

RENEWAL PARTS

Refer to York USER'S MAINTENANCE and SERVICE INFORMATION MANUAL Part Number 035-18843-004.

APPROVALS

Design listed by CSA as follows:

- For use as a cooling unit only with or without optional electric heat.
- For use as a forced air furnace with cooling unit
- For outdoor installation only.
- For installation on combustible material.
- For use with natural gas or propane gas.

CAUTION

This product must be installed in strict compliance with the enclosed installation instructions and any applicable local, state, and national codes including, but not limited to, building, electrical, and mechanical codes.

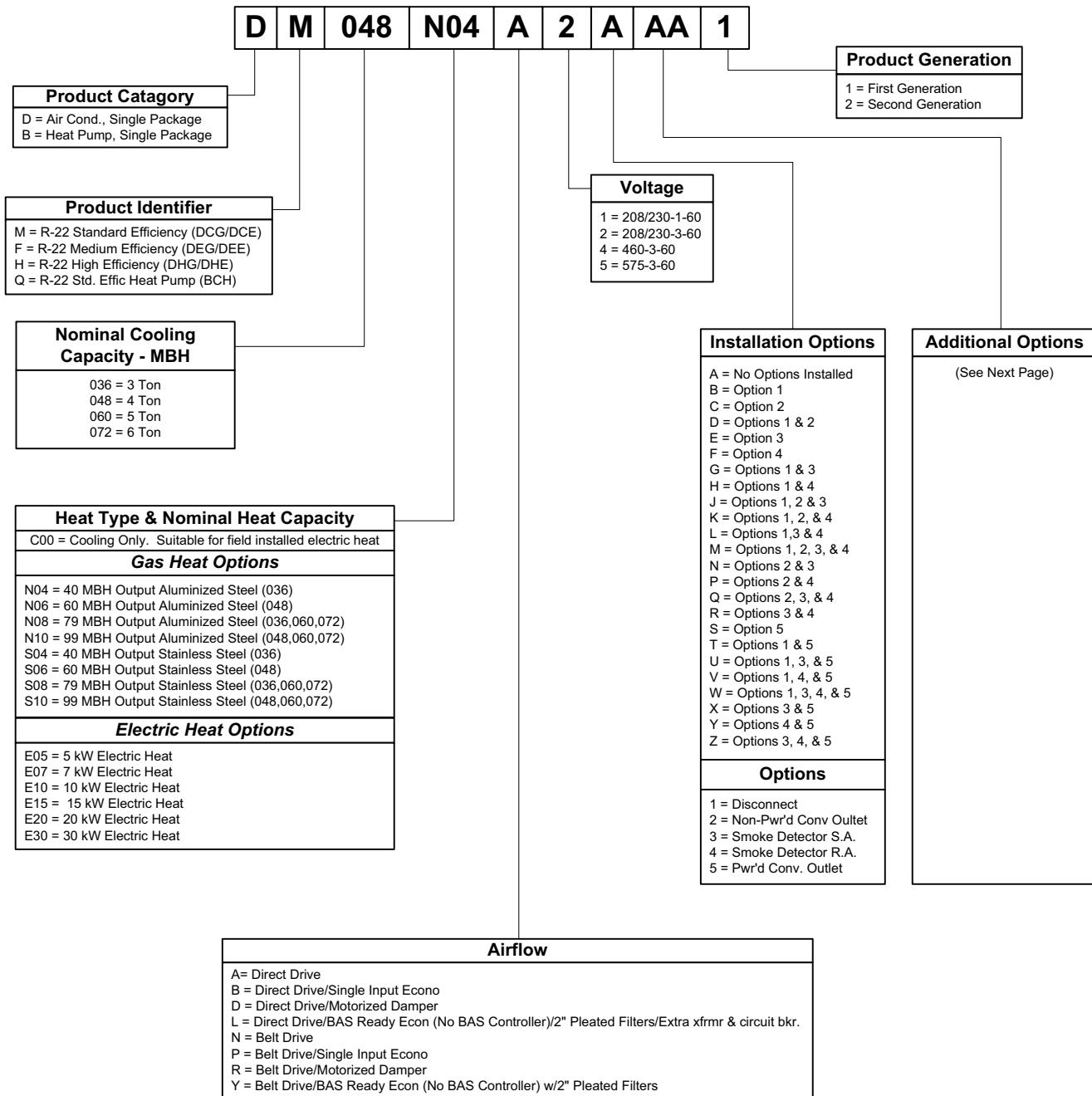
WARNING

Improper installation may create a condition where the operation of the product could cause personal injury or property damage.

The installer should pay particular attention to the words: NOTE, CAUTION and WARNING. Notes are intended to clarify or make the installation easier. Cautions are given to prevent equipment damage. Warnings are given to alert installer that personal injury and/or equipment damage may result if installation procedure is not handled properly.

PRODUCT NOMENCLATURE

3-6 Ton Sunline Model Number Nomenclature



3-6T Sunline Model Number Nomenclature

Standard Cabinet	
AA	None
AB	Phase Monitor
AC	Coil Guard
AD	Dirty Filter Switch
AE	Phase Monitor & Coil Guard
AF	Phase Monitor & Dirty Filter Switch
AG	Coil Guard & Dirty Filter Switch
AH	Phase Monitor, Coil Guard, & Dirty Filter Switch
AJ	SS Drain Pan
AK	SS Drain Pan & Phase Monitor
AL	SS Drain Pan & Coil Guard
AM	SS Drain Pan & Dirty Filter Switch
AN	SS Drain Pan, Phase Monitor, Coil Guard & Dirty Filter Switch
AS	Bottom Drain Connection
CA	CPC Controller with Dirty Filter Switch & Air Proving Switch
CB	CPC Controller, DFS, APS & Phase Monitor
CC	CPC Controller, DFS, APS & Coil Guard
CD	CPC Controller, DFS, APS, Phase Monitor, & Coil Guard
CE	CPC Controller, DFS, APS & Technicoat Cond. Coil
CF	CPC Controller, DFS, APS, Technicoat Cond. Coil, & Phase Monitor
CG	CPC Controller, DFS, APS, Technicoat Cond. Coil, & Coil Guard
CH	CPC Controller, DFS, APS, Technicoat Cond. Coil, Phase Monitor, & Coil Guard
CJ	CPC Controller, DFS, APS & Technicoat Evap. Coil
CK	CPC Controller, DFS, APS, Technicoat Evap. Coil, & Phase Monitor
CL	CPC Controller, DFS, APS, Technicoat Evap. Coil, & Coil Guard
CM	CPC Controller, DFS, APS, Technicoat Evap. Coil, Phase Monitor, & Coil Guard
CN	CPC Controller, DFS, APS & Technicoat Evap. & Cond Coils
CP	CPC Controller, DFS, APS, Technicoat Evap. & Cond Coils, & Phase Monitor
CQ	CPC Controller, DFS, APS, Technicoat Evap. & Cond Coils, & Coil Guard
CR	CPC Controller, DFS, APS, Technicoat Evap. & Cond Coils, Phase Monitor, & Coil Guard
CS	CPC Controller, DFS, APS, SS Drain Pan
CT	CPC Controller, DFS, APS, SS Drain Pan, Phase Monitor, & Coil Guard
CU	CPC Controller, DFS, APS, SS Drain Pan, & Technicoat Cond Coils
CV	CPC Controller, DFS, APS, SS Drain Pan, & Technicoat Evap Coil
CW	CPC Controller, DFS, APS, SS Drain Pan, & Technicoat Evap and Cond Coils
CX	CPC Controller, DFS, APS, SS Drain Pan, Phase Monitor, Coil Guard, & Technicoat Evap and Cond Coils
JA	Johnson UNT Controller with Dirty Filter Switch & Air Proving Switch
JB	Johnson UNT Controller, DFS, APS & Phase Monitor
JC	Johnson UNT Controller, DFS, APS & Coil Guard
JD	Johnson UNT Controller, DFS, APS, Phase Monitor, & Coil Guard
JE	Johnson UNT Controller, DFS, APS & Technicoat Cond. Coil
JF	Johnson UNT Controller, DFS, APS, Technicoat Cond. Coil, & Phase Monitor
JG	Johnson UNT Controller, DFS, APS, Technicoat Cond. Coil, & Coil Guard
JH	Johnson UNT Controller, DFS, APS, Technicoat Cond. Coil, Phase Monitor, & Coil Guard
JJ	Johnson UNT Controller, DFS, APS & Technicoat Evap. Coil
JK	Johnson UNT Controller, DFS, APS, Technicoat Evap. Coil, & Phase Monitor
JL	Johnson UNT Controller, DFS, APS, Technicoat Evap. Coil, & Coil Guard
JM	Johnson UNT Controller, DFS, APS, Technicoat Evap. Coil, Phase Monitor, & Coil Guard
JN	Johnson UNT Controller, DFS, APS & Technicoat Evap. & Cond Coils
JP	Johnson UNT Controller, DFS, APS, Technicoat Evap. & Cond Coils, & Phase Monitor
JQ	Johnson UNT Controller, DFS, APS, Technicoat Evap. & Cond Coils, & Coil Guard
JR	Johnson UNT Controller, DFS, APS, Technicoat Evap. & Cond Coils, Phase Monitor, & Coil Guard
JS	Johnson UNT Controller, DFS, APS, SS Drain Pan

Standard Cabinet	
JT	Johnson UNT Controller, DFS, APS, SS Drain Pan, Phase Monitor, & Coil Guard
JU	Johnson UNT Controller, DFS, APS, SS Drain Pan, & Technicoat Cond Coils
JV	Johnson UNT Controller, DFS, APS, SS Drain Pan, & Technicoat Evap Coil
JW	Johnson UNT Controller, DFS, APS, SS Drain Pan, & Technicoat Evap and Cond Coils
JX	Johnson UNT Controller, DFS, APS, SS Drain Pan, Phase Monitor, Coil Guard, & Technicoat Evap and Cond Coils
HA	Honeywell Excel 10 Controller with Dirty Filter Switch & Air Proving Switch
HB	Honeywell Excel 10 Controller, DFS, APS & Phase Monitor
HC	Honeywell Excel 10 Controller, DFS, APS & Coil Guard
HD	Honeywell Excel 10 Controller, DFS, APS, Phase Monitor, & Coil Guard
HE	Honeywell Excel 10 Controller, DFS, APS & Technicoat Cond. Coil
HF	Honeywell Excel 10 Controller, DFS, APS, Technicoat Cond. Coil, & Phase Monitor
HG	Honeywell Excel 10 Controller, DFS, APS, Technicoat Cond. Coil, & Coil Guard
HH	Honeywell Excel 10 Controller, DFS, APS, Technicoat Cond. Coil, Phase Monitor, & Coil Guard
HJ	Honeywell Excel 10 Controller, DFS, APS & Technicoat Evap. Coil
HK	Honeywell Excel 10 Controller, DFS, APS, Technicoat Evap. Coil, & Phase Monitor
HL	Honeywell Excel 10 Controller, DFS, APS, Technicoat Evap. Coil, & Coil Guard
HM	Honeywell Excel 10 Controller, DFS, APS, Technicoat Evap. Coil, Phase Monitor, & Coil Guard
HN	Honeywell Excel 10 Controller, DFS, APS & Technicoat Evap. & Cond Coils
HP	Honeywell Excel 10 Controller, DFS, APS, Technicoat Evap. & Cond Coils, & Phase Monitor
HQ	Honeywell Excel 10 Controller, DFS, APS, Technicoat Evap. & Cond Coils, & Coil Guard
HR	Honeywell Excel 10 Controller, DFS, APS, Technicoat Evap. & Cond Coils, Phase Monitor, & Coil Guard
HS	Honeywell Excel 10 Controller, DFS, APS, SS Drain Pan
HT	Honeywell Excel 10 Controller, DFS, APS, SS Drain Pan, Phase Monitor, & Coil Guard
HU	Honeywell Excel 10 Controller, DFS, APS, SS Drain Pan, & Technicoat Cond Coils
HV	Honeywell Excel 10 Controller, DFS, APS, SS Drain Pan, & Technicoat Evap Coil
HW	Honeywell Excel 10 Controller, DFS, APS, SS Drain Pan, & Technicoat Evap and Cond Coils
HX	Honeywell Excel 10 Controller, DFS, APS, SS Drain Pan, Phase Monitor, Coil Guard, & Technicoat Evap and Cond Coils
NA	Novar ETC-3 Controller with Dirty Filter Switch & Air Proving Switch
NB	Novar ETC-3 Controller, DFS, APS & Phase Monitor
NC	Novar ETC-3 Controller, DFS, APS & Coil Guard
ND	Novar ETC-3 Controller, DFS, APS, Phase Monitor, & Coil Guard
NE	Novar ETC-3 Controller, DFS, APS & Technicoat Cond. Coil
NF	Novar ETC-3 Controller, DFS, APS, Technicoat Cond. Coil, & Phase Monitor
NG	Novar ETC-3 Controller, DFS, APS, Technicoat Cond. Coil, & Coil Guard
NH	Novar ETC-3 Controller, DFS, APS, Technicoat Cond. Coil, Phase Monitor, & Coil Guard
NJ	Novar ETC-3 Controller, DFS, APS & Technicoat Evap. Coil
NK	Novar ETC-3 Controller, DFS, APS, Technicoat Evap. Coil, & Phase Monitor
NL	Novar ETC-3 Controller, DFS, APS, Technicoat Evap. Coil, & Coil Guard
NM	Novar ETC-3 Controller, DFS, APS, Technicoat Evap. Coil, Phase Monitor, & Coil Guard
NN	Novar ETC-3 Controller, DFS, APS & Technicoat Evap. & Cond Coils
NP	Novar ETC-3 Controller, DFS, APS, Technicoat Evap. & Cond Coils, & Phase Monitor
NQ	Novar ETC-3 Controller, DFS, APS, Technicoat Evap. & Cond Coils, & Coil Guard
NR	Novar ETC-3 Controller, DFS, APS, Technicoat Evap. & Cond Coils, Phase Monitor, & Coil Guard
NS	Novar ETC-3 Controller, DFS, APS, SS Drain Pan
NT	Novar ETC-3 Controller, DFS, APS, SS Drain Pan, Phase Monitor, & Coil Guard
NU	Novar ETC-3 Controller, DFS, APS, SS Drain Pan, & Technicoat Cond Coils
NV	Novar ETC-3 Controller, DFS, APS, SS Drain Pan, & Technicoat Evap Coil
NW	Novar ETC-3, DFS, APS, SS Drain Pan, & Technicoat Evap and Cond Coils
NX	Novar ETC-3 Controller, DFS, APS, SS Drain Pan, Phase Monitor, Coil Guard, & Technicoat Evap and Cond Coils
TA	Technicoat Condenser Coil
TB	Technicoat Condenser Coil & Phase Monitor
TC	Technicoat Condenser Coil & Coil Guard
TD	Technicoat Condenser Coil & Dirty Filter Switch
TE	Technicoat Condenser Coil, Phase Monitor, & Coil Guard

Standard Cabinet	
TF	Technicoat Condenser Coil, Phase Monitor, & Dirty Filter Switch
TG	Technicoat Condenser Coil, Coil Guard, & Dirty Filter Switch
TH	Technicoat Condenser Coil, Phase Monitor, Coil Guard, & Dirty Filter Switch
TJ	Technicoat Evaporator Coil
TK	Technicoat Evaporator Coil & Phase Monitor
TL	Technicoat Evaporator Coil & Coil Guard
TM	Technicoat Evaporator Coil & Dirty Filter Switch
TN	Technicoat Evaporator Coil, Phase Monitor, & Coil Guard
TP	Technicoat Evaporator Coil, Phase Monitor, & Dirty Filter Switch
TQ	Technicoat Evaporator Coil, Coil Guard, & Dirty Filter Switch
TR	Technicoat Evaporator Coil, Phase Monitor, Coil Guard, & Dirty Filter Switch
TS	Technicoat Evaporator & Condenser Coils
TT	Technicoat Evaporator & Condenser Coils & Phase Monitor
TU	Technicoat Evaporator & Condenser Coils & Coil Guard
TV	Technicoat Evaporator & Condenser Coils & Dirty Filter Switch
TW	Technicoat Evaporator & Condenser Coils, Phase Monitor, & Coil Guard
TX	Technicoat Evaporator & Condenser Coils, Phase Monitor, & Dirty Filter Switch
TY	Technicoat Evaporator & Condenser Coils, Coil Guard, & Dirty Filter Switch
TZ	Technicoat Evaporator & Condenser Coils, Phase Monitor, Coil Guard, & Dirty Filter Switch
T1	Technicoat Condenser & SS Drain Pan
T3	Technicoat Condenser Coil, SS Drain Pan, Phase Monitor, Coil Guard, & Dirty Filter Switch
T4	Technicoat Evaporator & SS Drain Pan
T6	Technicoat Evaporator Coil, SS Drain Pan, Phase Monitor, Coil Guard, & Dirty Filter Switch
T7	Technicoat Evaporator & Condenser Coils & SS Drain Pan
T9	Technicoat Evaporator & Condenser Coils, SS Drain Pan, Phase Monitor, Coil Guard, & Dirty Filter Switch
LA	Simplicity Intelli-Comfort Controller
LB	Simplicity Intelli-Comfort Controller, & Phase Monitor
LC	Simplicity Intelli-Comfort Controller, & Coil Guard
LD	Simplicity Intelli-Comfort Controller, Phase Monitor, & Coil Guard
LE	Simplicity Intelli-Comfort Controller, & Technicoat Cond. Coil
LF	Simplicity Intelli-Comfort Controller, Technicoat Cond. Coil, & Phase Monitor
LG	Simplicity Intelli-Comfort Controller, Technicoat Cond. Coil, & Coil Guard
LH	Simplicity Intelli-Comfort Controller, Technicoat Cond. Coil, Phase Monitor, & Coil Guard
LJ	Simplicity Intelli-Comfort Controller, & Technicoat Evap. Coil
LK	Simplicity Intelli-Comfort Controller, Technicoat Evap. Coil, & Phase Monitor
LL	Simplicity Intelli-Comfort Controller, Technicoat Evap. Coil, & Coil Guard
LM	Simplicity Intelli-Comfort Controller, Technicoat Evap. Coil, Phase Monitor, & Coil Guard
LN	Simplicity Intelli-Comfort Controller, & Technicoat Evap. & Cond Coils
LP	Simplicity Intelli-Comfort Controller, Technicoat Evap. & Cond Coils, & Phase Monitor
LQ	Simplicity Intelli-Comfort Controller, Technicoat Evap. & Cond Coils, & Coil Guard
LR	Simplicity Intelli-Comfort Controller, Technicoat Evap. & Cond Coils, Phase Monitor, & Coil Guard
LS	Simplicity Intelli-Comfort Controller, SS Drain Pan
LT	Simplicity Intelli-Comfort Controller, SS Drain Pan, Phase Monitor, & Coil Guard
LU	Simplicity Intelli-Comfort Controller, SS Drain Pan, & Technicoat Cond Coils
LV	Simplicity Intelli-Comfort Controller, SS Drain Pan, & Technicoat Evap Coil
LW	Simplicity Intelli-Comfort Controller, SS Drain Pan, & Technicoat Evap and Cond Coils
LX	Simplicity Intelli-Comfort Controller, SS Drain Pan, Phase Monitor, Coil Guard, & Technicoat Evap and Cond Coils
WA	Intelli-Comfort w/Mod Link Controller
WB	Intelli-Comfort w/Mod Link Controller, & Phase Monitor
WC	Intelli-Comfort w/Mod Link Controller, & Coil Guard
WD	Intelli-Comfort w/Mod Link Controller, Phase Monitor, & Coil Guard
WE	Intelli-Comfort w/Mod Link Controller, & Technicoat Cond. Coil
WF	Intelli-Comfort w/Mod Link Controller, Technicoat Cond. Coil, & Phase Monitor
WG	Intelli-Comfort w/Mod Link Controller, Technicoat Cond. Coil, & Coil Guard

Standard Cabinet

WH	Intelli-Comfort w/Mod Link Controller, Technicoat Cond. Coil, Phase Monitor, & Coil Guard
WJ	Intelli-Comfort w/Mod Link Controller, & Technicoat Evap. Coil
WK	Intelli-Comfort w/Mod Link Controller, Technicoat Evap. Coil, & Phase Monitor
WL	Intelli-Comfort w/Mod Link Controller, Technicoat Evap. Coil, & Coil Guard
WM	Intelli-Comfort w/Mod Link Controller, Technicoat Evap. Coil, Phase Monitor, & Coil Guard
WN	Intelli-Comfort w/Mod Link Controller, & Technicoat Evap. & Cond Coils
WP	Intelli-Comfort w/Mod Link Controller, Technicoat Evap. & Cond Coils, & Phase Monitor
WQ	Intelli-Comfort w/Mod Link Controller, Technicoat Evap. & Cond Coils, & Coil Guard
WR	Intelli-Comfort w/Mod Link Controller, Technicoat Evap. & Cond Coils, Phase Monitor, & Coil Guard
WS	Intelli-Comfort w/Mod Link Controller, SS Drain Pan
WT	Intelli-Comfort w/Mod Link Controller, SS Drain Pan, Phase Monitor, & Coil Guard
WU	Intelli-Comfort w/Mod Link Controller, SS Drain Pan, & Technicoat Cond Coils
WV	Intelli-Comfort w/Mod Link Controller, SS Drain Pan, & Technicoat Evap Coil
WW	Intelli-Comfort w/Mod Link Controller, SS Drain Pan, & Technicoat Evap and Cond Coils
WX	Intelli-Comfort w/Mod Link Controller, SS Drain Pan, Phase Monitor, Coil Guard, & Technicoat Evap and Cond Coils

Hinged Filter Door & Toolless Access Cabinet

BA	Hinged Filter Door & Toolless Access Panels
BB	Phase Monitor, Hinged Filter Door & Toolless Access Panels
BC	Coil Guard, Hinged Filter Door & Toolless Access Panels
BD	Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
BE	Phase Monitor & Coil Guard, Hinged Filter Door & Toolless Access Panels
BF	Phase Monitor & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
BG	Coil Guard & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
BH	Phase Monitor, Coil Guard, & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
BJ	SS Drain Pan & Hinged Filter Door & Toolless Access Panels
BK	SS Drain Pan & Phase Monitor, Hinged Filter Door & Toolless Access Panels
BL	SS Drain Pan & Coil Guard, Hinged Filter Door & Toolless Access Panels
BM	SS Drain Pan & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
BN	SS Drain Pan & Phase Monitor & Coil Guard, Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
BS	Bottom Drain Connection, Hinged Filter Door & Toolless Access Panels
DA	CPC Controller with Dirty Filter Switch & Air Proving Switch, Hinged Filter Door & Toolless Access Panels
DB	CPC Controller, DFS, APS & Phase Monitor, Hinged Filter Door & Toolless Access Panels
DC	CPC Controller, DFS, APS & Coil Guard, Hinged Filter Door & Toolless Access Panels
DD	CPC Controller, DFS, APS, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolless Access Panels
DE	CPC Controller, DFS, APS & Technicoat Cond. Coil, Hinged Filter Door & Toolless Access Panels
DF	CPC Controller, DFS, APS, Technicoat Cond. Coil, & Phase Monitor, Hinged Filter Door & Toolless Access Panels
DG	CPC Controller, DFS, APS, Technicoat Cond. Coil, & Coil Guard, Hinged Filter Door & Toolless Access Panels
DH	CPC Controller, DFS, APS, Technicoat Cond. Coil, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolless Access Panels
DJ	CPC Controller, DFS, APS & Technicoat Evap. Coil, Hinged Filter Door & Toolless Access Panels
DK	CPC Controller, DFS, APS, Technicoat Evap. Coil, & Phase Monitor, Hinged Filter Door & Toolless Access Panels
DL	CPC Controller, DFS, APS, Technicoat Evap. Coil, & Coil Guard, Hinged Filter Door & Toolless Access Panels
DM	CPC Controller, DFS, APS, Technicoat Evap. Coil, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolless Access Panels
DN	CPC Controller, DFS, APS & Technicoat Evap. & Cond Coils, Hinged Filter Door & Toolless Access Panels
DP	CPC Controller, DFS, APS, Technicoat Evap. & Cond Coils, & Phase Monitor, Hinged Filter Door & Toolless Access Panels
DQ	CPC Controller, DFS, APS, Technicoat Evap. & Cond Coils, & Coil Guard, Hinged Filter Door & Toolless Access Panels
DR	CPC Controller, DFS, APS, Technicoat Evap. & Cond Coils, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolless Access Panels
DS	CPC Controller, DFS, APS, SS Drain Pan Hinged Filter Door & Toolless Access Panels
DT	CPC Controller, DFS, APS, SS Drain Pan, Phase Monitor, & Coil Guard Hinged Filter Door & Toolless Access Panels
DU	CPC Controller, DFS, APS, SS Drain Pan, & Technicoat Cond Coils Hinged Filter Door & Toolless Access Panels
DV	CPC Controller, DFS, APS, SS Drain Pan, & Technicoat Evap Coil Hinged Filter Door & Toolless Access Panels
DW	CPC Controller, DFS, APS, SS Drain Pan, & Technicoat Evap and Cond Coils Hinged Filter Door & Toolless Access Panels
DX	CPC Controller, DFS, APS, SS Drain Pan, Phase Monitor, Coil Guard, & Technicoat Evap and Cond Coils Hinged Filter Door & Toolless Access Panels

Hinged Filter Door & Toolless Access Cabinet	
PF	Novar ETC-3 Controller, DFS, APS, Technicoat Cond. Coil, & Phase Monitor, Hinged Filter Door & Toolless Access Panels
PG	Novar ETC-3 Controller, DFS, APS, Technicoat Cond. Coil, & Coil Guard, Hinged Filter Door & Toolless Access Panels
PH	Novar ETC-3 Controller, DFS, APS, Technicoat Cond. Coil, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolless Access Panels
PJ	Novar ETC-3 Controller, DFS, APS & Technicoat Evap. Coil, Hinged Filter Door & Toolless Access Panels
PK	Novar ETC-3 Controller, DFS, APS, Technicoat Evap. Coil, & Phase Monitor, Hinged Filter Door & Toolless Access Panels
PL	Novar ETC-3 Controller, DFS, APS, Technicoat Evap. Coil, & Coil Guard, Hinged Filter Door & Toolless Access Panels
PM	Novar ETC-3 Controller, DFS, APS, Technicoat Evap. Coil, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolless Access Panels
PN	Novar ETC-3 Controller, DFS, APS & Technicoat Evap. & Cond Coils, Hinged Filter Door & Toolless Access Panels
PP	Novar ETC-3 Controller, DFS, APS, Technicoat Evap. & Cond Coils, & Phase Monitor, Hinged Filter Door & Toolless Access Panels
PQ	Novar ETC-3 Controller, DFS, APS, Technicoat Evap. & Cond Coils, & Coil Guard, Hinged Filter Door & Toolless Access Panels
PR	Novar ETC-3 Controller, DFS, APS, Technicoat Evap. & Cond Coils, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolless Access Panels
PS	Novar ETC-3 Controller, DFS, APS, SS Drain Pan
PT	Novar ETC-3 Controller, DFS, APS, SS Drain Pan, Phase Monitor, & Coil Guard
PU	Novar ETC-3 Controller, DFS, APS, SS Drain Pan, & Technicoat Cond Coils
PV	Novar ETC-3 Controller, DFS, APS, SS Drain Pan, & Technicoat Evap Coil
PW	Novar ETC-3, DFS, APS, SS Drain Pan, & Technicoat Evap and Cond Coils
PX	Novar ETC-3 Controller, DFS, APS, SS Drain Pan, Phase Monitor, Coil Guard, & Technicoat Evap and Cond Coils
UA	Technicoat Condenser Coil, Hinged Filter Door & Toolless Access Panels
UB	Technicoat Condenser Coil & Phase Monitor, Hinged Filter Door & Toolless Access Panels
UC	Technicoat Condenser Coil & Coil Guard, Hinged Filter Door & Toolless Access Panels
UD	Technicoat Condenser Coil & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
UE	Technicoat Condenser Coil, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolless Access Panels
UF	Technicoat Condenser Coil, Phase Monitor, & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
UG	Technicoat Condenser Coil, Coil Guard, & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
UH	Technicoat Condenser Coil, Phase Monitor, Coil Guard, & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
UJ	Technicoat Evaporator Coil, Hinged Filter Door & Toolless Access Panels
UK	Technicoat Evaporator Coil & Phase Monitor, Hinged Filter Door & Toolless Access Panels
UL	Technicoat Evaporator Coil & Coil Guard, Hinged Filter Door & Toolless Access Panels
UM	Technicoat Evaporator Coil & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
UN	Technicoat Evaporator Coil, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolless Access Panels
UP	Technicoat Evaporator Coil, Phase Monitor, & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
UQ	Technicoat Evaporator Coil, Coil Guard, & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
UR	Technicoat Evaporator Coil, Phase Monitor, Coil Guard, & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
US	Technicoat Evaporator & Condenser Coils, Hinged Filter Door & Toolless Access Panels
UT	Technicoat Evaporator & Condenser Coils & Phase Monitor, Hinged Filter Door & Toolless Access Panels
UU	Technicoat Evaporator & Condenser Coils & Coil Guard, Hinged Filter Door & Toolless Access Panels
UV	Technicoat Evaporator & Condenser Coils & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
UW	Technicoat Evaporator & Condenser Coils, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolless Access Panels
UX	Technicoat Evaporator & Condenser Coils, Phase Monitor, & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
UY	Technicoat Evaporator & Condenser Coils, Coil Guard, & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
UZ	Technicoat Evaporator & Condenser Coils, Phase Monitor, Coil Guard, & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
U1	Technicoat Condenser & SS Drain Pan, Hinged Filter Door & Toolless Access Panels
U3	Technicoat Condenser Coil, SS Drain Pan, Phase Monitor, Coil Guard, & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
U4	Technicoat Evaporator & SS Drain Pan, Hinged Filter Door & Toolless Access Panels
U6	Technicoat Evaporator Coil, SS Drain Pan, Phase Monitor, Coil Guard, & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
U7	Technicoat Evaporator & Condenser Coils & SS Drain Pan, Hinged Filter Door & Toolless Access Panels
U9	Technicoat Evaporator & Condenser Coils, SS Drain Pan, Phase Monitor, Coil Guard, & Dirty Filter Switch, Hinged Filter Door & Toolless Access Panels
QA	Simplicity Intelli-Comfort Controller with Hinged Filter Door & Toolless Access Panels
QB	Simplicity Intelli-Comfort Controller, & Phase Monitor, Hinged Filter Door & Toolless Access Panels
QC	Simplicity Intelli-Comfort Controller, & Coil Guard, Hinged Filter Door & Toolless Access Panels
QD	Simplicity Intelli-Comfort Controller, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolless Access Panels
QE	Simplicity Intelli-Comfort Controller, & Technicoat Cond. Coil, Hinged Filter Door & Toolless Access Panels
QF	Simplicity Intelli-Comfort Controller, Technicoat Cond. Coil, & Phase Monitor, Hinged Filter Door & Toolless Access Panels
QG	Simplicity Intelli-Comfort Controller, Technicoat Cond. Coil, & Coil Guard, Hinged Filter Door & Toolless Access Panels

Hinged Filter Door & Toolless Access Cabinet	
QH	Simplicity Intelli-Comfort Controller, Technicoat Cond. Coil, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolless Access
QJ	Simplicity Intelli-Comfort Controller, & Technicoat Evap. Coil, Hinged Filter Door & Toolless Access Panels
QK	Simplicity Intelli-Comfort Controller, Technicoat Evap. Coil, & Phase Monitor, Hinged Filter Door & Toolless Access Panels
QL	Simplicity Intelli-Comfort Controller, Technicoat Evap. Coil, & Coil Guard, Hinged Filter Door & Toolless Access Panels
QM	Simplicity Intelli-Comfort Controller, Technicoat Evap. Coil, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolless Access
QN	Simplicity Intelli-Comfort Controller, & Technicoat Evap. & Cond Coils, Hinged Filter Door & Toolless Access Panels
QP	Simplicity Intelli-Comfort Controller, Technicoat Evap. & Cond Coils, & Phase Monitor, Hinged Filter Door & Toolless Access Pan
QQ	Simplicity Intelli-Comfort Controller, Technicoat Evap. & Cond Coils, & Coil Guard, Hinged Filter Door & Toolless Access Panels
QR	Simplicity Intelli-Comfort Controller, Technicoat Evap. & Cond Coils, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolles
QS	Simplicity Intelli-Comfort Controller, SS Drain Pan Hinged Filter Door & Toolless Access Panels
QT	Simplicity Intelli-Comfort Controller, SS Drain Pan, Phase Monitor, & Coil Guard Hinged Filter Door & Toolless Access Panels
QU	Simplicity Intelli-Comfort Controller, SS Drain Pan, & Technicoat Cond Coils Hinged Filter Door & Toolless Access Panels
QV	Simplicity Intelli-Comfort Controller, SS Drain Pan, & Technicoat Evap Coil Hinged Filter Door & Toolless Access Panels
QW	Simplicity Intelli-Comfort Controller, SS Drain Pan, & Technicoat Evap and Cond Coils Hinged Filter Door & Toolless Access Panels
QX	Simplicity Intelli-Comfort Controller, SS Drain Pan, Phase Monitor, Coil Guard, & Technicoat Evap and Cond Coils Hinged Filter Door & Toolless Access Panels
XA	Intelli-Comfort w/Mod Link Controller, Hinged Filter Door & Toolless Access Panels
XB	Intelli-Comfort w/Mod Link Controller, & Phase Monitor, Hinged Filter Door & Toolless Access Panels
XC	Intelli-Comfort w/Mod Link Controller, & Coil Guard, Hinged Filter Door & Toolless Access Panels
XD	Intelli-Comfort w/Mod Link Controller, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolless Access Panels
XE	Intelli-Comfort w/Mod Link Controller, & Technicoat Cond. Coil, Hinged Filter Door & Toolless Access Panels
XF	Intelli-Comfort w/Mod Link Controller, Technicoat Cond. Coil, & Phase Monitor, Hinged Filter Door & Toolless Access Panels
XG	Intelli-Comfort w/Mod Link Controller, Technicoat Cond. Coil, & Coil Guard, Hinged Filter Door & Toolless Access Panels
XH	Intelli-Comfort w/Mod Link Controller, Technicoat Cond. Coil, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolless Access
XJ	Intelli-Comfort w/Mod Link Controller, & Technicoat Evap. Coil, Hinged Filter Door & Toolless Access Panels
KK	Intelli-Comfort w/Mod Link Controller, Technicoat Evap. Coil, & Phase Monitor, Hinged Filter Door & Toolless Access Panels
XL	Intelli-Comfort w/Mod Link Controller, Technicoat Evap. Coil, & Coil Guard, Hinged Filter Door & Toolless Access Panels
XM	Intelli-Comfort w/Mod Link Controller, Technicoat Evap. Coil, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolless Access
XN	Intelli-Comfort w/Mod Link Controller, & Technicoat Evap. & Cond Coils, Hinged Filter Door & Toolless Access Panels
XP	Intelli-Comfort w/Mod Link Controller, Technicoat Evap. & Cond Coils, & Phase Monitor, Hinged Filter Door & Toolless Access Pan
XQ	Intelli-Comfort w/Mod Link Controller, Technicoat Evap. & Cond Coils, & Coil Guard, Hinged Filter Door & Toolless Access Panels
XR	Intelli-Comfort w/Mod Link Controller, Technicoat Evap. & Cond Coils, Phase Monitor, & Coil Guard, Hinged Filter Door & Toolles
XS	Intelli-Comfort w/Mod Link Controller, SS Drain Pan Hinged Filter Door & Toolless Access Panels
XT	Intelli-Comfort w/Mod Link Controller, SS Drain Pan, Phase Monitor, & Coil Guard Hinged Filter Door & Toolless Access Panels
XU	Intelli-Comfort w/Mod Link Controller, SS Drain Pan, & Technicoat Cond Coils Hinged Filter Door & Toolless Access Panels
XV	Intelli-Comfort w/Mod Link Controller, SS Drain Pan, & Technicoat Evap Coil Hinged Filter Door & Toolless Access Panels
XW	Intelli-Comfort w/Mod Link Controller, SS Drain Pan, & Technicoat Evap and Cond Coils Hinged Filter Door & Toolless Access Panels
XX	Intelli-Comfort w/Mod Link Controller, SS Drain Pan, Phase Monitor, Coil Guard, & Technicoat Evap and Cond Coils Hinged Filter Door & Toolless Access Panels

INSTALLATION

INSTALLATION SAFETY INFORMATION:

Read these instructions before continuing this appliance installation. This is an outdoor combination heating and cooling unit. The installer must assure that these instructions are made available to the consumer and with instructions to retain them for future reference.

1. Refer to the furnace rating plate for the approved type of gas for this furnace.
2. Install this furnace only in a location and position as specified on page 15 of these instructions.

3. Never test for gas leaks with an open flame. Use commercially available soap solution made specifically for the detection of leaks when checking all connections.
4. Always install furnace to operate within the furnace's intended temperature-rise range with the duct system and within the allowable external static pressure range, as specified on the unit name/rating plate.
5. This equipment is not to be used for temporary heating or cooling of buildings or structures under construction.

WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow the safety warning exactly could result in serious injury, death or property damage.

Never test for gas leaks with an open flame, use a commercially available soap solution made specifically for the detection of leaks to check all connections. A fire or explosion may result causing property damage, personal injury or loss of life.

LIMITATIONS

These units must be installed in accordance with the following national and local safety codes:

In U.S.A.:

- National Electrical Code ANSI/NFPA No. 70.
- National Fuel Gas Code Z223.1.

- Gas-Fired Central Furnace Standard ANSI Z21.47a.
- Local gas utility requirements.

In Canada:

- Current Canadian Electrical Code C22.1.
- Current Gas Installation Codes CSA-B149.1.
- Local plumbing and waste water codes.
- Other applicable local codes.

Refer to the Unit Application Data Table 1 and to the Gas Heat Application Data Table 4.

If components are to be added to a unit to meet local codes, they are to be installed at the dealer's and/or the customer's expense.

Size of unit for proposed installation should be based on heat loss/heat gain calculation made according to the methods of the Air Conditioning Contractors of America (ACCA).

TABLE 1: UNIT APPLICATION DATA (DM, DF, DH)

UNIT MODEL NUMBER	036	048	060	072
Voltage Variation, Min. / Max. 1	208/230	187 / 252		
	460	432 / 504		
	575	540 / 630		
Supply Air CFM, Nom.	1200	1600	2000	2400
Wet Bulb Temperature (°F) of Air on Evaporator Coil, Min. / Max	57 / 72			
Dry Bulb Temperature (°F) of Air on Condenser Coil, Min. / Max.	0 / 120			

1. Utilization range "A" in accordance with ARI Standard 110.

LOCATION

Use the following guidelines to select a suitable location for these units.

1. Unit is designed for outdoor installation only.
2. Condenser coils must have an unlimited supply of air.
3. Where a choice of location is possible, position the unit on either north or east side of building.

4. For ground level installation, use a level concrete slab with a minimum thickness of 4 inches. The length and width should be at least 6 inches greater than the unit base rails. Do not tie slab to the building foundation.
5. Roof structures must be able to support the weight of the unit and its options and/or accessories. Unit must be installed on a solid level roof curb or appropriate angle iron frame.
6. Maintain level tolerance to 1/2 inch maximum across the entire length or width of the unit.

⚠ WARNING

Excessive exposure of this furnace to contaminated combustion air may result in equipment damage or personal injury. Typical contaminants include: permanent wave solutions, chlorinated waxes and cleaners, chlorine based swimming pool chemicals, water softening chemicals, carbon tetrachloride, Halogen type refrigerants, cleaning solvents (e.g. perchloroethylene), printing inks, paint removers, varnishes, hydrochloric acid, cements and glues, antistatic fabric softeners for clothes dryers, masonry acid washing materials.

If a unit is to be installed on a roof curb or special frame other than a YORK roof curb, gasketing must be applied to all surfaces that come in contact with the unit underside.

RIGGING AND HANDLING

Exercise care when moving the unit. Do not remove any packaging until the unit is near the place of installation. Rig the unit by attaching chain or cable slings to the lifting holes provided in the base rails. Spreader bars, whose length exceeds the largest dimension across the unit, **MUST BE USED**.

Units may also be moved or lifted with a forklift. Slotted openings in the base rails are provided for this purpose. Fork lengths must be a minimum of 42 inches.

Remove the nesting brackets from the four corners on the top of the unit. All screws that are removed when removing the brackets must be replaced on the unit.

Refer to Tables 14, 16 and 18 for unit weights and to the Figure 9 for approximate center of gravity.

⚠ CAUTION

Before lifting a unit, make sure that all panels are in place and that its weight is distributed equally on all cables so it will lift evenly.

CLEARANCES

All units require certain clearances for proper operation and service. Installer must make provisions for adequate combustion and ventilation air in accordance with

Section 5.3, Air for Combustion and Ventilation of the National Fuel Gas Code, ANSI Z223.1 (in U.S.A.) or Sections 7.2, 7.3 or 7.4 of Gas Installation Codes CSA-B149.1 (in Canada) and/or applicable provisions of the local building codes. Refer to Dimensions and Clearances shown in Figures 10 through 13 and Tables 41 and 42 for the clearances required for combustible construction, servicing, and proper unit operation.

⚠ WARNING

Do not permit overhanging structures or shrubs to obstruct outdoor air discharge outlet, combustion air inlet or vent outlets.

DUCTWORK

Ductwork should be designed and sized according to the methods in Manual Q of the Air Conditioning Contractors of America (ACCA).

A closed return duct system shall be used. This shall not preclude use of economizers or outdoor fresh air intake. The supply and return air duct connections at the unit should be made with flexible joints to minimize noise.

The supply and return air duct systems should be designed for the CFM and static requirements of the job. They should NOT be sized to match the dimensions of the duct connections on the unit.

⚠ CAUTION

When fastening ductwork to side duct flanges on unit, insert screws through duct flanges only. DO NOT insert screws through casing. Outdoor ductwork must be insulated and waterproofed.

Refer to Figures 10 through 14 for information concerning side and bottom supply and return air duct openings.

NOTE: It is recommended that, in Canada, the outlet duct be provided with a removable access panel. It is recommended that this opening be accessible when the unit is installed in service, and of a size such that smoke or reflected light may be observed inside the casing to indicate the presence of leaks in the heat exchanger. The cover should be attached in a manner adequate to prevent leakage.

CONDENSATE DRAIN

Plumbing must conform to local codes. Use a sealing compound on male pipe threads. Install a condensate drain line from the 3/4" NPT female connection on the unit to an open drain.

NOTE: The condensate drain operates in a negative pressure in the cabinet. The condensate drain line **MUST** be trapped to provide proper drainage. See Figure 1.

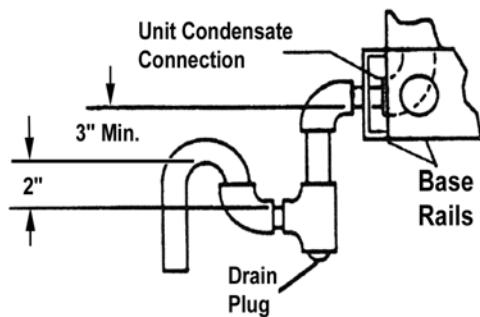


FIGURE 1 - RECOMMENDED DRAIN PIPING

COMPRESSORS

Units are shipped with compressor mountings factory-adjusted and ready for operation.

Units with scroll compressors have a shipping bracket which must be removed after the unit is set in place. See Figure 2.

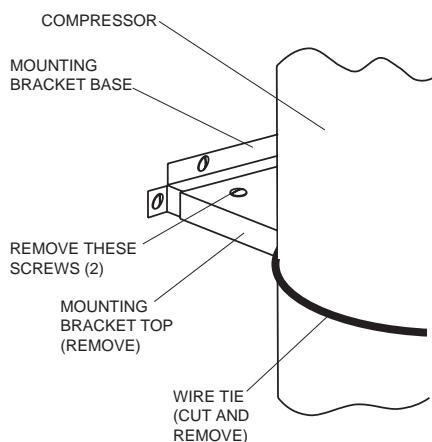


FIGURE 2 - COMPRESSOR RESTRAINING BRACKET

CAUTION

Do not loosen compressor mounting bolts.

FILTERS

One-inch or two-inch filters can be supplied with each unit. Filters must always be installed ahead of the evaporator coil and must be kept clean or replaced with same size and type. Dirty filters will reduce the capacity of the unit and will result in frosted coils or safety shutdown. Minimum filter area and required sizes are shown in Physical Data Tables 13, 15 & 17.

SERVICE ACCESS

The following removable panels provide access to all serviceable components:

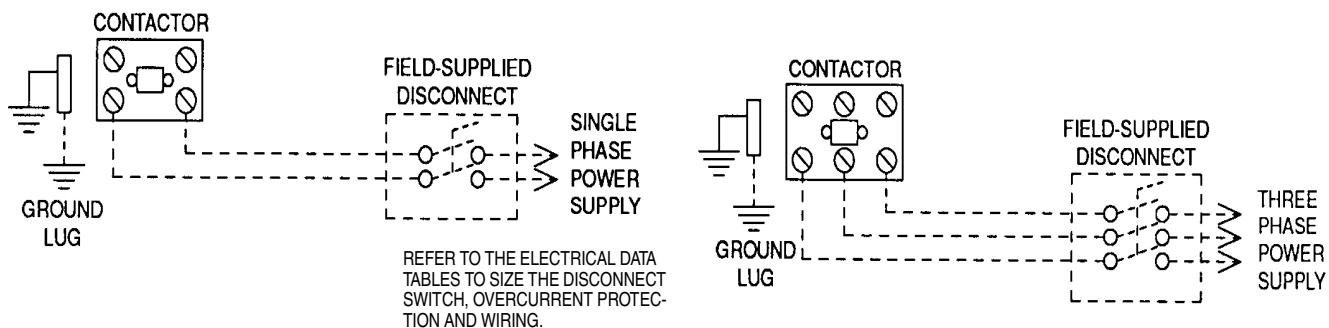
- Compressor compartment
- Electric Heat compartment
- Gas Heat compartment (Two panels)
- Side Supply & Return Air compartments (Two panels)
- Blower compartment (Three panels)
- Main control box
- Filter compartment
- Outdoor Air compartment (Two panels)

Refer to the Dimensions and Clearances shown in Figures 10, 11, 13 and 14 for location of these access panels.

CAUTION

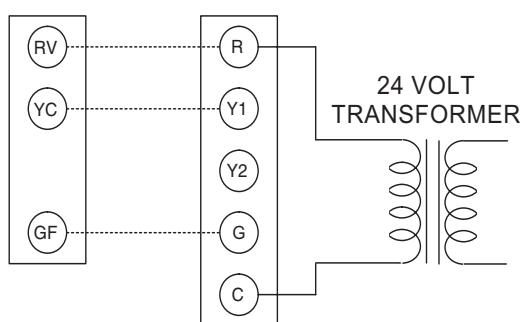
Make sure that all screws and panel latches are replaced and properly positioned on the unit to maintain an airtight seal.

TYPICAL POWER WIRING



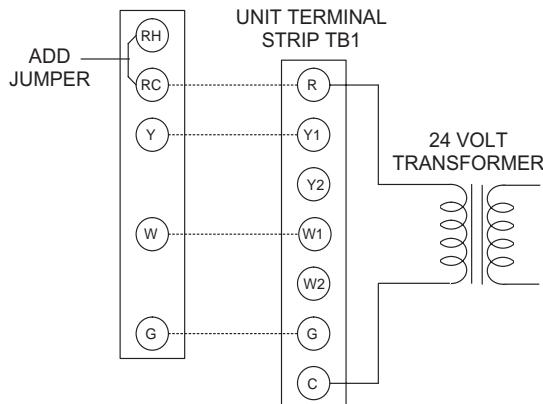
TYPICAL CONTROL WIRING

COOLING ONLY (24 VOLT THERMOSTAT)

THERMOSTAT¹ UNIT TERMINAL TERMINALS

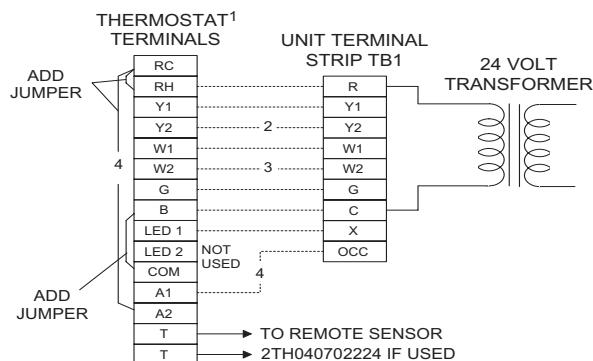
¹24 VOLT THERMOSTAT 2TH07701024. TO CONTROL THE ECONOMIZER ON SECOND STAGE COOLING, USE THE THERMOSTAT 2TH0401224.

COOLING / HEATING (24 VOLT THERMOSTAT)

THERMOSTAT¹ TERMINALS

¹24 VOLT THERMOSTAT 2ET07701024. TO CONTROL THE ECONOMIZER ON THE SECOND STAGE COOLING OR TO HAVE AN ELECTRIC HEAT ACCESSORY WITH TWO STAGES OF HEAT, USE THERMOSTAT 2TH0471024.

COOLING / HEATING (ELECTRONIC THERMOSTAT) MULTI STAGE



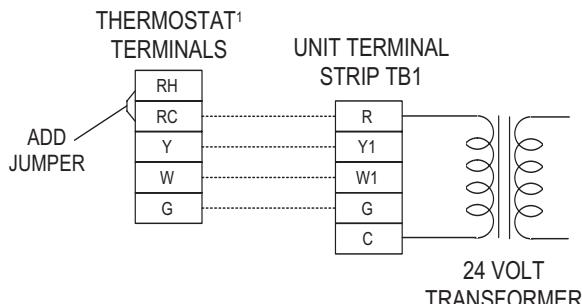
¹ ELECTRONIC PROGRAMMABLE THERMOSTAT 2ET04700224 (INCLUDES SUBBASE).

² SECOND STAGE COOLING IS NOT REQUIRED ON UNITS LESS ECONOMIZER.

³ SECOND STAGE HEATING IS ONLY REQUIRED ON UNITS WITH A TWO STAGE ELECTRIC HEATER.

⁴ REMOVE JUMPER J2 FROM TERMINALS 4 AND 9 ON JUMPER PLUG CONNECTOR P6 ON UNITS WITH ECONOMIZER. TERMINALS A1 AND A2 PROVIDE A RELAY OUT-PUT TO CLOSE THE OUTDOOR ECONOMIZER DAMPERS WHEN THE THERMOSTAT SWITCHES TO THE SET-BACK POSITION.

COOLING / HEATING (ELECTRONIC THERMOSTAT) SINGLE STAGE



¹ ELECTRONIC PROGRAMMABLE THERMOSTAT 2ET07701024 (INCLUDES SUBBASE). TO CONTROL THE ECONOMIZER ON SECOND STAGE COOLING, USE THERMOSTAT 2TH0470024.

FIGURE 3 - TYPICAL FIELD POWER & CONTROL WIRING

THERMOSTAT

The room thermostat should be located on an inside wall approximately 56 inches above the floor where it will not be subject to drafts, sun exposure or heat from electrical fixtures or appliances. Follow the manufacturer's instructions enclosed with the thermostat for general installation procedure. A minimum of seven color-coded insulated wires (#18 AWG) should be used to connect the thermostat to the unit.

POWER AND CONTROL WIRING

Field wiring to the unit must conform to provisions of the National Electrical Code, ANSI / NFPA No. 70 (in U.S.A.), current Canadian Electrical Code C22.1 (in Canada) and/or local ordinances. The unit must be electrically grounded in accordance with NEC and CEC (as specified above) and/or local codes. Voltage tolerances, which must be maintained at the compressor terminals, during starting and running conditions, are indicated on the unit Rating Plate and the Unit Application Data table.

The internal wiring harness furnished with this unit is an integral part of a CSA design certified unit. Field alteration to comply with electrical codes should not be required.

A fused disconnect switch should be field provided for the unit. The switch must be separate from all other circuits. Wire entry at knockout openings require conduit fittings to comply with NEC (in U.S.A.), CEC (in Canada) and/or local codes. If any of the wire supplied with the unit must be replaced, replacement wire must be of the type shown on the wiring diagram and the same minimum gauge as the replaced wire.

Use copper conductors properly sized to carry the load. Each unit must be wired with a separate branch circuit fed directly from the meter panel and properly fused.

CAUTION

When connecting electrical power and control wiring to the unit, waterproof type connectors **MUST BE USED** so that water or moisture cannot be drawn into the unit during normal operation. The above waterproofing conditions will also apply when installing a field-supplied disconnect switch.

Refer to the Typical Field Wiring Figure 3 and to the appropriate unit wiring diagram for control circuit and power wiring information.

TABLE 2: CONTROL WIRE SIZES

Wire Size	Maximum Length ¹
18 AWG	150 Feet

¹. From the unit to the thermostat and back to the unit.

OPTIONS/ACCESSORIES

ELECTRIC HEAT

The factory- or field-installed heaters are wired for single point power supply. Power supply need only be brought into the single point terminal block and thermostat wiring to the low voltage terminal strip located in the upper portion of the unit control box.

These CSA approved heaters are located within the central compartment of the unit with the heater elements extending into the supply air chamber. Refer to Figure 10 for access panel location.

Fuses are supplied, where required, by the factory. Some KW sizes require fuses and others do not. Refer to Table 3 for minimum CFM limitations and to Tables 19 through 40 for electrical data.

TABLE 3: ELECTRIC HEATER CFM LIMITATIONS

UNIT MODEL SIZE NOMINAL TONS	VOLTAGE	MINIMUM SUPPLY AIR CFM					
		HEATER SIZE NOMINAL KW					
		5	7	10	15	20	30
3	208/230-1-60	1100	1100	1200	1200	1300	-
	208/230-3-60	1100	1100	1200	1200	1300	-
	460-3-60	-	1100	1200	1200	1300	-
	575-3-60	-	-	1200	1200	1300	-
4	208/230-1-60	1300	1300	1300	1300	1300	-
	208/230-3-60	1300	1300	1300	1300	1300	-
	460-3-60	-	1300	1300	1300	1300	-
	575-3-60	-	-	1300	1300	1400	-
5	208/230-1-60	1600	1600	1600	1600	1600	1600
	208/230-3-60	1600	1600	1600	1600	1600	1600
	460-3-60	-	1600	1600	1600	1600	1600
	575-3-60	-	-	1600	1600	1600	1800
6	208/230-1-60	1800	1800	1800	1800	1800	1800
	208/230-3-60	1800	1800	1800	1800	1800	1800
	460-3-60	-	1800	1800	1800	1800	1800
	575-3-60	-	-	1800	1800	1800	1800

GAS HEAT

These gas-fired heaters have aluminized-steel or optional stainless steel, tubular heat exchangers with spark ignition with proven pilot.

All gas heaters are shipped from the factory equipped for natural gas use. See Gas Heat Application Data Table.

For natural gas heating installations in locations requiring low NO_x emissions, Accessory model 1LN0404 must be used.

TABLE 4: GAS HEAT APPLICATION DATA

GAS HEAT OPTION	INPUT CAPACITY (MBH)	OUTPUT CAPACITY (MBH)	AVAILABLE ON MODELS	GAS RATE ¹ (Ft ³ /Hr)	TEMPERATURE RISE °F AT FULL INPUT ²	
					MIN.	MAX.
N04	50	40	3 TON	47	15	45
N06	75	60	4 TON	70	25	55
N08	100	79	3/5/6 TON	93	40/25/25	70/55/55
N10	125	99	4/5/6 TON	116	45/35/35	75/65/65

NOTE: Gas Heaters are shipped available for natural gas, but can be converted to L.P. with Kit Model No. 1NP0434.

All furnaces meet the latest California seasonal efficiency requirements.

1. Based on 1075 Btu/Ft³.

2. The air flow must be adjusted to obtain a temperature rise within the range shown.

GAS PIPING

Proper sizing of gas piping depends on the cubic feet per hour of gas flow required, specific gravity of the gas and the length of run. "National Fuel Gas Code" Z223.1 (in U.S.A.) or the current Gas Installation Codes CSA-B149.1 (in Canada) should be followed in all cases unless superseded by local codes or gas utility requirements. Refer to the Pipe Sizing Table 5.

The heating value of the gas may differ with locality. The value should be checked with the local gas utility.

NOTE: There may be a local gas utility requirement specifying a minimum diameter for gas piping. All units require a 1/2" pipe connection at the entrance fitting.

TABLE 5: GAS PIPE SIZING

LENGTH IN FEET	NOMINAL IRON PIPE SIZE			
	1/2 in.	3/4 in.	1 in.	1-1/4 in.
10	132	278	520	1,050
20	92	190	350	730
30	73	152	285	590
40	63	130	245	500
50	56	115	215	440
60	50	105	195	400
70	46	96	180	370
80	43	90	170	350
90	40	84	160	320
100	38	79	150	305

Maximum capacity of pipe in cubic feet of gas per hour. (Based upon a pressure drop of 0.3 inch water column and 0.6 specific gravity gas).

GAS CONNECTION

The gas supply line can be routed through the knock-outs located on the front of the unit or through the opening provided in the unit's base. Refer to Figure 11 to locate these access openings. Typical supply piping arrangements are shown in Figures 4 and 5. All shaded items are field-supplied.

If gas supply line is routed through the unit's base ensure that the burner assembly can be removed for maintenance without disturbing the supply line. The supply piping and fittings must lie below the bottom gas manifold to avoid interference with the burner assembly.

Two grommets are shipped in the blower compartment (in parts bag taped to the blower housing) of every unit with gas heat and should be used in the knockouts when the gas piping penetrates the front of the unit.

After the gas supply piping has been installed, the bottom opening in the unit should be sealed to prevent water from leaking into the building.

Gas piping recommendations:

1. A drip leg and a ground joint union must be installed in the gas piping.
2. When required by local codes, a manual shut-off valve may have to be installed outside of the unit.
3. Use wrought iron or steel pipe for all gas lines. Pipe compound should be applied sparingly to male threads only.

WARNING

Natural gas may contain some propane. Propane, being an excellent solvent, will quickly dissolve white lead or most standard commercial compounds. Therefore, a special pipe compound must be applied when wrought iron or steel pipe is used. Shellac base compounds such as Gaskolac or Stalastic, and compounds such as Rectorseal #5, Clyde's or John Crane may be used.

4. All piping should be cleaned of dirt and scale by hammering on the outside of the pipe and blowing out the loose dirt and scale. Before initial start-up, be sure that all of the gas lines external to the unit have been purged of air.
5. The gas supply should be a separate line and installed in accordance with all safety codes as prescribed under "Limitations". After the gas connections have been completed, open the main shut-off valve admitting normal gas pressure to the mains. Check all joints for leaks with soap solution or other material suitable for the purpose. **NEVER USE A FLAME.**

⚠ WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow the safety warning exactly could result in serious injury, death or property damage.

Never test for gas leaks with an open flame. use a commercially available soap solution made specifically for the detection of leaks to check all connections. A fire or explosion may result causing property damage, personal injury or loss of life.

6. The furnace and its individual manual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 psig (3.48kPa).

The furnace must be isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 psig (3.48kPa).

7. A 1/8 inch NPT plugged tap, accessible for test gage connection, must be installed immediately upstream of the gas supply connection to the furnace.

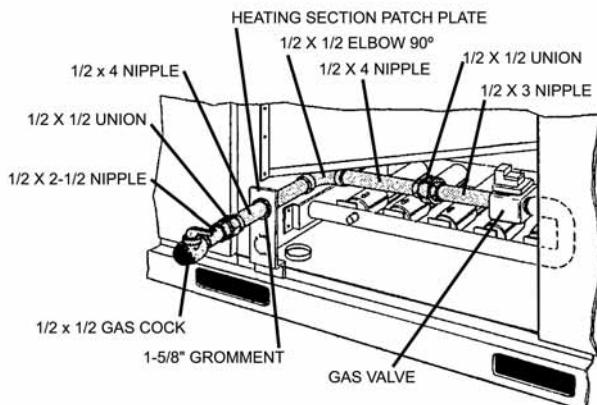


FIGURE 4 - EXTERNAL SUPPLY CONNECTION EXTERNAL SHUT-OFF

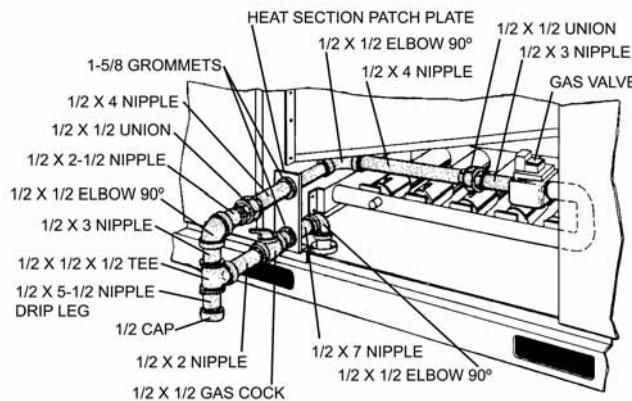


FIGURE 5 - BOTTOM SUPPLY CONNECTION EXTERNAL SHUT-OFF

L.P. UNITS, TANKS AND PIPING

All gas heat units are shipped from the factory equipped for natural gas use only. The unit may be converted in the field for use with L.P./propane gas with accessory kit model number 1NP0440.

All L.P./propane gas equipment must conform to the safety standards of the National Fire Protection Association.

For satisfactory operation, adequate L.P./propane gas pressure must be provided at the unit manifold under full load. Maintaining proper gas pressure depends on three main factors:

1. The vaporization rate depends on (a) the temperature of the liquid and (b) the "wetted surface" area of the container or containers.
2. The proper pressure regulation. (Two-stage regulation is recommended from the standpoint of both cost and efficiency.)
3. The pressure drop in the lines between regulators and between the second stage regulator and the appliance. Pipe size required will depend on the length of the pipe run and the total load of all appliances.

Complete information regarding tank sizing for vaporization, recommended regulator settings, and pipe sizing is available from most regulator manufacturers and L.P./propane gas suppliers.

L.P./propane gas is an excellent solvent and special pipe compound must be used when assembling piping for this gas as it will quickly dissolve white lead or most standard commercial compounds. Shellac base compounds such as Rectorseal #5 are satisfactory for this type of gas.

Check all connections for leaks when piping is completed, using a soap solution. **NEVER USE A FLAME.**

WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow the safety warning exactly could result in serious injury, death or property damage.

Never test for gas leaks with an open flame. use a commercially available soap solution made specifically for the detection of leaks to check all connections. A fire or explosion may result causing property damage, personal injury or loss of life.

VENT AND COMBUSTION AIR HOODS

The vent hood and combustion air hood (with screens) are shipped attached to the blower housing in the blower compartment. These hoods must be installed to assure proper unit function. All hoods must be fastened to the outside of the gas heat access panel with the screws provided in the bag also attached to the blower housing.

The screen for the combustion air intake hood is secured to the inside of the access panel opening with three fasteners and the screws used for mounting the hood to the panel. The top flange of this hood slips in under the top of the access panel opening when installing. Refer to Vent and Combustion Air Hood Figure 6.

The vent hood is installed by inserting the top flange of the hood into the slotted opening in the access panel and securing in place.

The products of combustion are discharged horizontally through these two screened, hooded vent openings on the upper gas heat access panel.

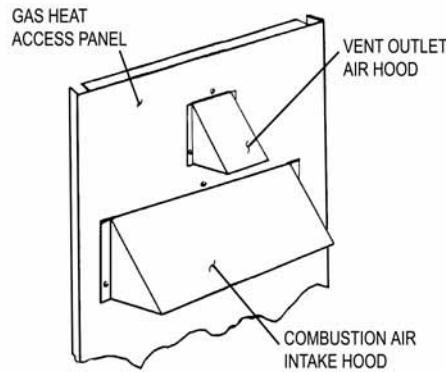


FIGURE 6 - VENT AND COMBUSTION AIR HOOD

CAUTION

An adhesive backed label is provided over the outside of the combustion air inlet opening to prevent moisture from entering the unit, which could cause damage to electrical components. Allow this closure label to remain in place until the combustion air hood is to be installed.

ECONOMIZER/MOTORIZED DAMPER AND RAIN HOOD

The instruction for the optional economizer/motorized damper and rain hood can be found in form 035-07364-000. Use these instructions when field assembling an economizer rain hood onto a unit. The outdoor and return air dampers, the damper actuator, the damper linkage, the outdoor and return air divider baffles, and all the control sensors are factory mounted as part of the "Factory installed" economizer/motorized damper options.

POWER EXHAUST/BAROMETRIC RELIEF DAMPER AND RAIN HOOD

The instructions for the power exhaust/barometric relief damper and rain hood can be found in form 530.18-N1.10V.

All of the components, including the dampers, hardware, and mounting instructions are shipped in a single package external from the unit and must be field assembled and installed.

Power exhaust is only available as a field installed accessory.

ECONOMIZER AND POWER EXHAUST DAMPER SET POINT ADJUSTMENTS AND INFORMATION

Remove the economizer access panel from the unit. Loosen but do not remove the two panel latches. Locate the economizer control module, where the following adjustments will be made.

CAUTION

Extreme care must be exercised in turning all setpoint, maximum, and minimum damper positioning adjustment screws to prevent twisting them off.

Check that the damper blades move smoothly without binding; carefully turn the Minimum Position Adjusting screw (found on the damper control module) fully clockwise and then set the thermostat indoor fan switch to the on position and then off, or energize and de-energize terminals "R" to "G".

MINIMUM POSITION ADJUSTMENT

With thermostat set to indoor fan on position, or terminals "R" to "G" energized, turn the Minimum Position Adjusting screw (located on the damper control module) counterclockwise until the desired minimum damper position has been attained.

ENTHALPY SET POINT ADJUSTMENT

The enthalpy set point may now be set by selecting the desired setpoint shown in the Enthalpy Setpoint Adjustment Figure 7. Adjust as follows:

- For a single enthalpy operation carefully turn the set point adjusting screw (found on the damper control module) to the "A", "B", "C" or "D" setting corresponding to the lettered curve of the Enthalpy Setpoint Adjustment Figure 7.

- For a dual enthalpy operation, carefully turn the set point adjusting screw fully clockwise past the "D" setting.

POWER EXHAUST DAMPER SETPOINT (WITH OR WITHOUT POWER EXHAUST)

- With no power exhaust option, adjust the Exhaust Air Adjustment Screw fully clockwise.
- With power exhaust option, each building pressurization requirement will be different. The point at which the power exhaust comes on is determined by the economizer damper position (Percent Open). The Exhaust Air Adjustment Screw should be set at the Percent Open of the economizer damper at which the power exhaust is needed. It can be set from 0 to 100% damper open.

INDOOR AIR QUALITY

Indoor Air quality (indoor sensor input): Terminal AQ accepts a +2 to +10 Vdc signal with respect to the (AQ1) terminal. When the signal is below its setpoint, the actuator is allowed to modulate normally in accordance with the enthalpy and mixed air sensor inputs. When the AQ signal exceeds its setpoint setting and there is no call for free cooling, the actuator is proportionately modulated from the 2 to 10 Vdc signal, with 2 Vdc corresponding to full closed and 10 Vdc corresponding to full open. When there is no call for free cooling, the damper position is limited by the IAQ Max damper position setting. When the signal exceeds its setpoint (Demand Control Ventilation Setpoint) setting and there is a call for free cooling, the actuator modulates from the minimum position to the full open position based on the highest call from either the mixed air sensor input or the AQ voltage input.

- Optional CO₂ Space Sensor Kit Part # 2AQ04700324
- Optional CO₂ Unit Sensor Kit Part # 2AQ04700424

Replace the economizer access panel.

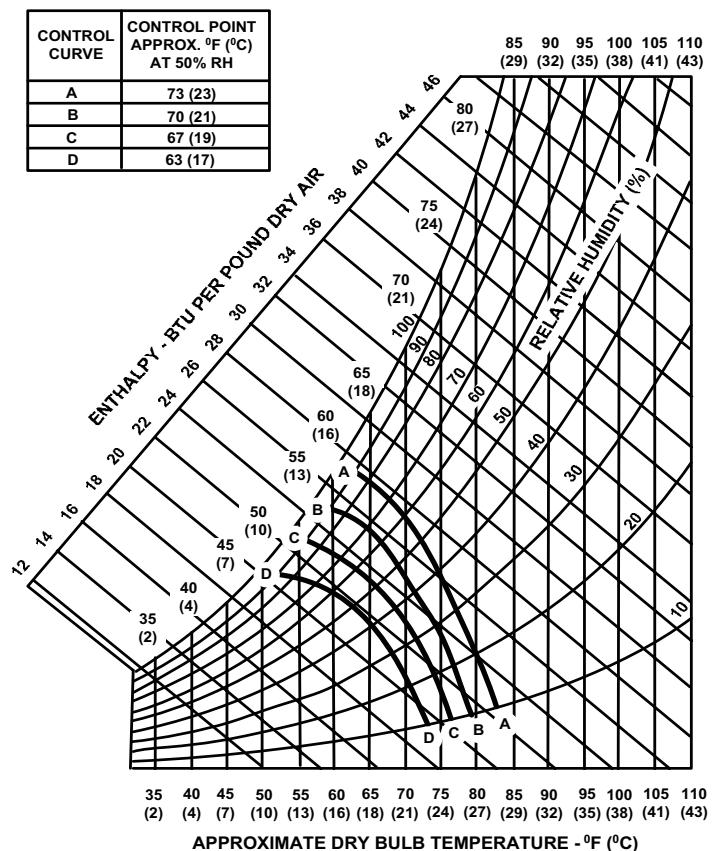


FIGURE 7 - ENTHALPY SETPOINT ADJUSTMENT

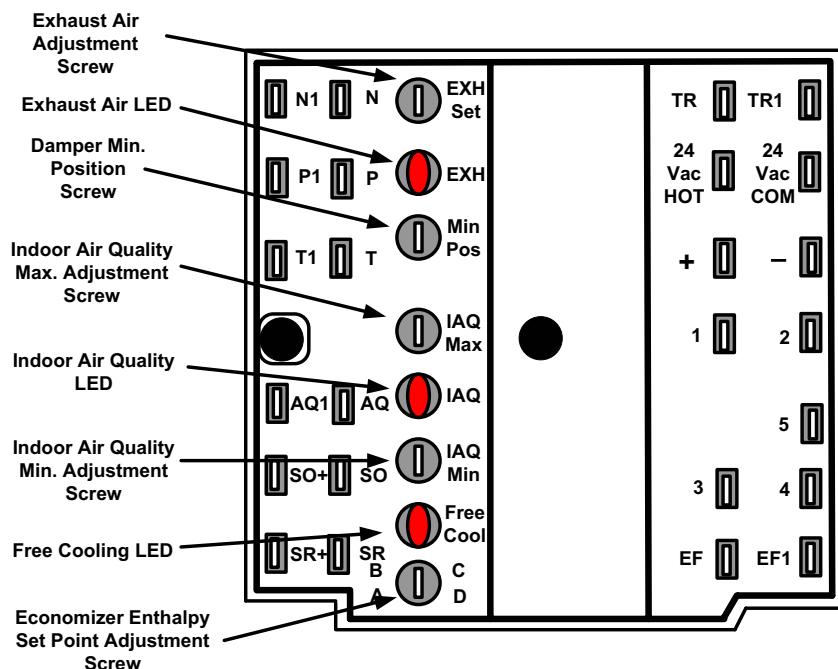
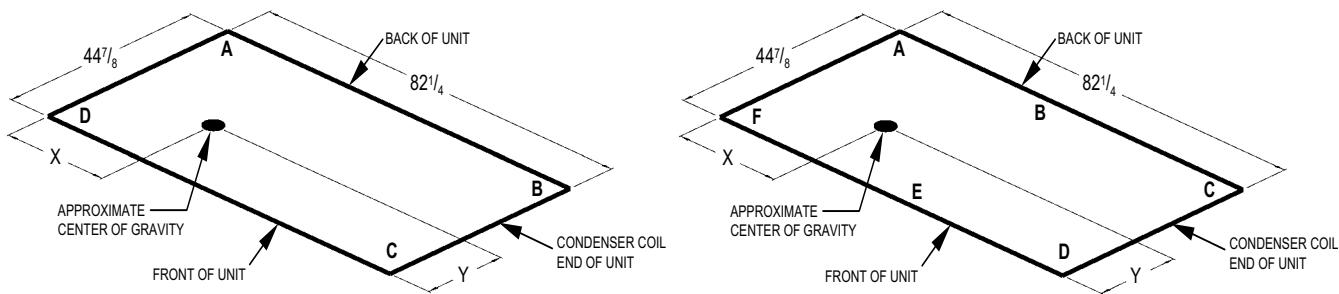


FIGURE 8 - HONEYWELL ECONOMIZER CONTROL W7212

**FIGURE 9 - FOUR AND SIX POINT LOADING****TABLE 6: CENTER OF GRAVITY (ALL MODELS)**

DIMENSION	3 - 5 TON	6 TON
X	40-3/4"	44"
Y	19-3/4"	22"

TABLE 7: DM 4 POINT LOADS WEIGHT DISTRIBUTION

UNIT	TOTAL	A	B	C	D
DM036 Cooling/ Electric	565	125	123	157	160
DM036N04	625	140	133	172	180
DM036N08	635	140	138	177	180
DM048 Cooling/ Electric	615	137	135	170	173
DM048N06	675	152	145	185	193
DM048N10	685	152	150	190	193
DM060 Cooling/ Electric	640	143	140	177	180
DM060N08	700	158	150	192	200
DM060N10	710	158	155	197	200
DM072 Cooling/ Electric	720	164	189	196	171
DM072N08	775	179	201	209	186
DM072N10	785	179	206	214	186

TABLE 8: DM 6 POINT LOADS WEIGHT DISTRIBUTION

UNIT	TOTAL	A	B	C	D	E	F
DM036 Cooling/ Electric	565	84	83	82	104	105	107
DM036N04	625	93	92	91	115	117	118
DM036N08	635	94	93	92	117	119	120
DM048 Cooling/ Electric	615	91	90	89	113	115	116
DM048N06	675	100	99	98	124	126	128
DM048N10	685	102	100	99	126	128	129
DM060 Cooling/ Electric	640	95	94	93	118	119	121
DM060N08	700	104	103	101	129	131	132
DM060N10	710	105	104	103	131	133	134
DM072 Cooling/ Electric	720	107	117	129	134	122	111
DM072N08	775	115	126	139	144	131	120
DM072N10	785	117	128	141	146	133	121

TABLE 9: DF 4 POINT LOADS WEIGHT DISTRIBUTION

UNIT	TOTAL	A	B	C	D
DF036 Cooling/ Electric	565	125	123	157	160
DF036N04	625	140	133	172	180
DF036N08	635	140	138	177	180
DF048 Cooling/ Electric	615	137	135	170	173
DF048N06	675	152	145	185	193
DF048N10	685	152	150	190	193
DF060 Cooling/ Electric	640	143	140	177	180
DF060N08	700	158	150	192	200
DF060N10	710	158	155	197	200
DF072 Cooling/ Electric	720	164	189	196	171
DF072N08	775	179	201	209	186
DF072N10	785	179	206	214	186

TABLE 10: DF 6 POINT LOADS WEIGHT DISTRIBUTION

UNIT	TOTAL	A	B	C	D	E	F
DF036 Cooling/ Electric	565	84	83	82	104	105	107
DF036N04	625	93	92	91	115	117	118
DF036N08	635	94	93	92	117	119	120
DF048 Cooling/ Electric	615	91	90	89	113	115	116
DF048N06	675	100	99	98	124	126	128
DF048N10	685	102	100	99	126	128	129
DF060 Cooling/ Electric	640	95	94	93	118	119	121
DF060N08	700	104	103	101	129	131	132
DF060N10	710	105	104	103	131	133	134
DF072 Cooling/ Electric	720	107	117	129	134	122	111
DF072N08	775	115	126	139	144	131	120
DF072N10	785	117	128	141	146	133	121

TABLE 11: DH 4 POINT LOADS WEIGHT DISTRIBUTION

UNIT	TOTAL	A	B	C	D
DH036 Cooling/ Electric	565	125	123	157	160
DH036N04	625	139	136	173	177
DH036N08	635	141	138	173	179
DH048 Cooling/ Electric	610	135	133	169	172
DH048N06	670	149	146	186	189
DH048N10	680	151	148	189	192
DH060 Cooling/ Electric	645	143	141	179	182
DH060N08	705	157	154	196	199
DH060N10	715	159	156	198	202

TABLE 12: DH 6 POINT LOADS WEIGHT DISTRIBUTION

UNIT	TOTAL	A	B	C	D	E	F
DH036 Cooling/ Electric	565	84	83	82	104	105	107
DH036N04	625	93	92	91	115	117	118
DH036N08	635	94	93	92	117	119	120
DH048 Cooling/ Electric	610	91	89	88	112	114	115
DH048N06	670	99	98	97	124	125	127
DH048N10	680	101	100	99	125	127	128
DH060 Cooling/ Electric	645	96	95	93	119	120	122
DH060N08	705	105	103	102	130	132	133
DH060N10	715	106	105	104	132	133	135

TABLE 13: DM PHYSICAL DATA

	MODELS	DM			
		036	048	060	072
EVAPORATOR BLOWER	Centrifugal Blower (Dia. x Wd. in.)	12 X 10	12 X 10	12 X 10	12 X 11
	Fan Motor HP (Direct Drive)	1/2	3/4	1	1
	Fan Motor HP (Belt Drive)	1 1/2	1 1/2	1 1/2	1 1/2
EVAPORATOR COIL	Rows Deep	3	3	3	4
	Fins Per Inch	13	13	13	13
	Face Area (Sq. Ft.)	3.6	4.3	5.1	5.1
CONDENSER FANS	Propeller Dia. (in.)	24	24	24	24
	Fan Motor Hp	1/4	1/4	1/4	1/4
	Nom. CFM	3400	3400	3400	3400
CONDENSER COILS	Rows Deep	1	1	1	2
	Fins Per Inch	16	16	22	16
	Face Area (Sq. Ft.)	17.1	17.1	17.1	16.7
COMPRESSOR (Qty. Per Unit)	Scroll Type	1	1	1	1
AIR FILTERS	Quantity Per Unit (15" X 20" X 1" or 2")	2	2	2	2
	Quantity Per Unit (14" X 25" X 1" or 2")	1	1	1	1
	Total Face Area (sq. ft.)	6.3	6.3	6.3	6.3
CHARGE	Refrigerant 22 (lbs./oz.)	5/8	6/8	6/8	10/0

TABLE 14: DM OPERATING WEIGHTS (LBS.)

	MODEL SIZE	3 TON	4 TON	5 TON	6 TON
BASIC UNIT	DM (Cooling Only)	565	615	640	720
	DM (Gas/Electric)	N04	625	-	-
		N06	-	675	-
		N08	635	-	700
		N10	-	685	710
OPTIONS	Economizer		50		
	Motorized Damper		26		
	Electric Heater	5 - 7 kW		18	
		10 - 15 kW		23	
		20 - 30 kW		28	
ACCY.	Roof Curb		92		
	Barometric Relief / Fixed Air Damper		10		
	Belt-Drive Blower		5		

TABLE 15: DF PHYSICAL DATA

MODELS		DF			
		036	048	060	072
EVAPORATOR BLOWER	Centrifugal Blower (Dia. x Wd. in.)	12 X 10	12 X 10	12 X 10	12 X 10
	Fan Motor HP (Direct Drive)	1/2	3/4	1	-
	Fan Motor HP (Belt Drive)	1 1/2	1 1/2	1 1/2	1 1/2
EVAPORATOR COIL	Rows Deep	3	3	3	4
	Fins Per Inch	13	13	13	13
	Face Area (Sq. Ft.)	3.6	4.3	5.1	5.1
CONDENSER FANS	Propeller Dia. (in.)	22	22	22	24
	Fan Motor Hp	1/2	1/2	1/2	1/2
	Nom. CFM	4500	4200	4500	4200
CONDENSER COILS	Rows Deep	2	2	2	2
	Fins Per Inch	18	18	18	18
	Face Area (Sq. Ft.)	17.1	17.1	17.1	17.1
COMPRESSOR (Qty. Per Unit)	Recip Type	1	1	1	1
AIR FILTERS	Quantity Per Unit (15" X 20" X 1" or 2")	2	2	2	2
	Quantity Per Unit (14" X 25" X 1" or 2")	1	1	1	-1
	Total Face Area (sq. ft.)	6.6	6.6	6.6	6.3
CHARGE	Refrigerant 22 (lbs./oz.)	9/12	9/8	9/8	11/10

TABLE 16: DF OPERATING WEIGHTS (LBS.)

MODEL SIZE		3 TON	4 TON	5 TON	6 TON
BASIC UNIT	DF (Cooling Only)	565	615	640	645
	DF (Gas/Electric)	N04	625	-	-
		N06	-	675	-
		N08	635	-	700
		N10	-	685	710
OPTIONS	Economizer			50	
	Motorized Damper			26	
	Electric Heater	5 - 7 kW		18	
		10 - 15 kW		23	
		20 - 30 kW		28	
ACCY.	Roof Curb			92	
	Barometric Relief / Fixed Air Damper			10	
	Belt-Drive Blower			5	

TABLE 17: DH PHYSICAL DATA

MODELS		DH		
		036	048	060
EVAPORATOR BLOWER	Centrifugal Blower (Dia. x Wd. in.)	12 X 10	12 X 10	12 X 10
	Fan Motor HP (Belt Drive)	1 1/2	1 1/2	1 1/2
EVAPORATOR COIL	Rows Deep	4	4	4
	Fins Per Inch	13	13	13
	Face Area (Sq. Ft.)	4.3	5.1	5.1
CONDENSER FANS	Propeller Dia. (in.)	24	24	24
	Fan Motor Hp	1/2	1/2	1/2
	Nom. CFM	4500	4200	4200
CONDENSER COILS	Rows Deep	2	2	2
	Fins Per Inch	18	18	18
	Face Area (Sq. Ft.)	17.1	17.1	17.1
COMPRESSOR (Qty. Per Unit)	Recip. Type	1	1	1
AIR FILTERS	Quantity Per Unit (15" X 20" X 1" or 2")	2	2	2
	Quantity Per Unit (14" X 25" X 1" or 2")	1	1	1
	Total Face Area (sq. ft.)	6.3	6.3	6.3
CHARGE	Refrigerant 22 (lbs./oz.)	10/8	10/4	10/14

TABLE 18: DH OPERATING WEIGHTS (LBS.)

MODEL SIZE		3 TON	4 TON	5 TON
BASIC UNIT	DH (Cooling Only)	565	610	645
	DH (Gas/Electric)	N04	625	-
		N06	-	670
		N08	635	-
		N10	-	705
OPTIONS	Economizer		50	
	Motorized Damper		26	
	Electric Heater	5 - 7 kW	18	
		10 - 15 kW	23	
		20 - 30 kW	28	
ACCY.	Roof Curb		92	
	Barometric Relief / Fixed Air Damper		10	
	Belt-Drive Blower		5	

TABLE 19: ELECTRICAL DATA - DM036 & 048 DIRECT DRIVE WITHOUT POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
3	208-1-60	18.0	105	1.3	4.4	0.0	NONE 2CE04510506 2CE04510706 2CE04511006 2CE04511506 2CE04512006	0.0 4.0 5.6 8.0 11.9 15.9	0.0 19.2 26.9 38.5 57.2 76.4	28.2 29.5 39.2 53.6 77.0 101.1	45 45 45 60 80 110
	230-1-60	18.0	105	1.3	4.4	0.0	NONE 2CE04510506 2CE04510706 2CE04511006 2CE04511506 2CE04512006	0.0 5.3 7.5 10.6 15.9 21.2	0.0 22.1 31.3 44.2 66.3 88.3	28.2 33.1 44.6 60.7 88.3 115.9	45 45 45 70 90 125
	208-3-60	11.4	90	1.3	4.4	0.0	NONE 2CE04510525 ² 2CE04510725 ² 2CE04511025 2CE04511525 2CE04512025	0.0 4.0 5.6 8.0 11.9 15.9	0.0 11.1 15.5 22.2 33.0 44.1	19.9 19.9 24.9 33.3 46.8 60.7	30 30 30 35 50 70
	230-3-60	11.4	90	1.3	4.4	0.0	NONE 2CE04510525 ² 2CE04510725 ² 2CE04511025 2CE04511525 2CE04512025	0.0 5.3 7.5 10.6 15.9 21.2	0.0 12.7 18.0 25.5 38.2 51.0	19.9 21.4 28.1 37.4 53.3 69.2	30 30 30 40 60 70
	460-3-60	6.2	45	0.8	2.2	0.0	NONE 2CE04510746 ² 2CE04511046 ² 2CE04511546 ² 2CE04512046 ²	0.0 6.8 10.1 13.6 19.5	0.0 8.2 12.1 16.4 23.5	10.8 13.0 17.9 23.2 32.1	15 15 20 25 35
	575-3-60	5.0	36	0.8	2.2	0.0	NONE 2CE04511058 2CE04511558 2CE04512058	0.0 10.6 15.9 21.2	0.0 10.2 15.3 20.4	8.7 14.9 21.3 27.7	15 15 25 30
	208-1-60	24.4	140	1.3	5.0	0.0	NONE 2CE04510506 2CE04510706 2CE04511006 2CE04511506 2CE04512006	0.0 4.0 5.6 8.0 11.9 15.9	0.0 19.2 26.9 38.5 57.2 76.4	36.8 36.8 39.9 54.3 77.8 101.8	60 60 60 60 80 110
	230-1-60	24.4	140	1.3	5.0	0.0	NONE 2CE04510506 2CE04510706 2CE04511006 2CE04511506 2CE04512006	0.0 5.3 7.5 10.6 15.9 21.2	0.0 22.1 31.3 44.2 66.3 88.3	36.8 36.8 45.3 61.5 89.1 116.7	60 60 60 70 90 125
	208-3-60	14.1	105	1.3	5.0	0.0	NONE 2CE04510525 ² 2CE04510725 ² 2CE04511025 2CE04511525 2CE04512025	0.0 4.0 5.6 8.0 11.9 15.9	0.0 11.1 15.5 22.2 33.0 44.1	23.9 23.9 25.7 34.0 47.5 61.4	35 35 35 35 50 70
	230-3-60	14.1	105	1.3	5.0	0.0	NONE 2CE04510525 ² 2CE04510725 ² 2CE04511025 2CE04511525 2CE04512025	0.0 5.3 7.5 10.6 15.9 21.2	0.0 12.7 18.0 25.5 38.2 51.0	23.9 23.9 28.8 38.1 54.1 70.0	35 35 35 40 60 70
4	460-3-60	7.1	55	0.8	2.2	0.0	NONE 2CE04510746 ² 2CE04511046 ² 2CE04511546 ² 2CE04512046 ²	0.0 6.8 10.1 13.6 19.5	0.0 8.2 12.1 16.4 23.5	11.9 13.0 17.9 23.2 32.1	15 15 20 25 35
	575-3-60	5.8	44	0.8	2.2	0.0	NONE 2CE04511058 2CE04511558 2CE04512058	0.0 10.6 15.9 21.2	0.0 10.2 15.3 20.4	9.7 14.9 21.3 27.7	15 15 25 30

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 20: ELECTRICAL DATA - DM060 & 072 DIRECT DRIVE WITHOUT POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
5	208-1-60	28.9	165	1.3	6.6	0.0	NONE	0.0	0.0	44.0	70
							2CE04510506	4.0	19.2	44.0	70
	230-1-60	28.9	165	1.3	6.6	0.0	2CE04510706	5.6	26.9	44.0	70
							2CE04511006	8.0	38.5	56.3	70
	208-3-60	16.0	125	1.3	6.6	0.0	2CE04511506	11.9	57.2	79.8	80
							2CE04512006	15.9	76.4	103.8	110
	230-3-60	16.0	125	1.3	6.6	0.0	2CE04513006	22.2	106.7	141.7	150
							NONE	0.0	0.0	44.0	70
	460-3-60	8.0	66.5	0.8	3.3	0.0	2CE04510525 ²	4.0	11.1	27.9	40
							2CE04510725 ²	5.6	22.1	44.0	70
6	575-3-60	6.4	50	0.8	3.3	0.0	2CE04511025	7.5	31.3	47.3	70
							2CE04511525	10.6	44.2	63.5	70
	208-3-60	18.9	146	1.3	6.8	0.0	2CE04512025	15.9	66.3	91.1	100
							2CE04513025	21.2	88.3	118.7	125
	230-3-60	18.9	146	1.3	6.8	0.0	NONE	0.0	0.0	27.9	40
							2CE04510525 ²	4.0	12.7	27.9	40
	460-3-60	9.5	73	0.8	3.6	0.0	2CE04510725 ²	7.5	18.0	30.8	40
							2CE04511025	10.6	25.5	40.1	45
	575-3-60	7.6	58.4	0.8	3.6	0.0	2CE04511525	15.9	38.2	56.1	60
							2CE04512025	21.2	51.0	72.0	80

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 21: ELECTRICAL DATA - DM036 & 048 BELT DRIVE WITHOUT POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
3	208-1-60	18.0	105	1.3	7.6	0.0	NONE	0.0	0.0	31.4	45
							2CE04510506	4.0	19.2	33.5	45
	230-1-60	18.0	105	1.3	7.6	0.0	2CE04510706	5.6	26.9	43.2	45
							2CE04511006	8.0	38.5	57.6	60
	208-3-60	11.4	90	1.3	5.2	0.0	2CE04511506	11.9	57.2	81.0	90
							2CE04512006	15.9	76.4	105.1	110
	230-3-60	11.4	90	1.3	5.2	0.0	NONE	0.0	0.0	31.4	45
							2CE04510525 ²	5.3	22.1	37.1	45
	460-3-60	6.2	45	0.8	2.6	0.0	2CE04510725 ²	7.5	31.3	48.6	50
							2CE04511025	10.6	44.2	64.7	70
4	575-3-60	5.0	36	0.8	2	0.0	2CE04511525	15.9	66.3	92.3	100
							2CE04512025	21.2	88.3	119.9	125
	208-1-60	24.4	140	1.3	7.6	0.0	NONE	0.0	0.0	20.8	30
							2CE04510506	4.0	19.2	20.8	30
	230-1-60	24.4	140	1.3	7.6	0.0	2CE04510706	5.6	26.9	29.1	30
							2CE04511006	8.0	38.5	38.4	40
	208-3-60	14.1	105	1.3	5.2	0.0	2CE04511506	11.9	57.2	54.3	60
							2CE04512006	15.9	76.4	70.2	80
	230-3-60	14.1	105	1.3	5.2	0.0	NONE	0.0	0.0	11.1	15
							2CE04510525 ²	5.3	22.1	12.7	15
	460-3-60	7.1	55	0.8	2.6	0.0	2CE04511046 ²	10.1	12.1	18.4	20
							2CE04511546 ²	13.6	16.4	23.7	25
	575-3-60	5.8	44	0.8	2	0.0	2CE04512046 ²	19.5	23.5	32.6	35

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 22: ELECTRICAL DATA - DM060 & 072 BELT DRIVE WITHOUT POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
5	208-1-60	28.9	165	1.3	7.6	0.0	NONE	0.0	0.0	45.0	70
							2CE04510506	4.0	19.2	45.0	70
	230-1-60	28.9	165	1.3	7.6	0.0	NONE	0.0	0.0	45.0	70
							2CE04510506	5.3	22.1	45.0	70
	208-3-60	16.0	125	1.3	5.2	0.0	NONE	0.0	0.0	26.5	40
							2CE04510525 ²	4.0	11.1	26.5	40
	230-3-60	16.0	125	1.3	5.2	0.0	NONE	0.0	0.0	26.5	40
							2CE04510725 ²	5.6	15.5	26.5	40
	460-3-60	8.0	66.5	0.8	2.6	0.0	NONE	0.0	0.0	13.4	20
							2CE04510746 ²	6.8	8.2	13.5	20
6	575-3-60	6.4	50	0.8	2	0.0	NONE	0.0	0.0	10.2	15
							2CE04511058	10.6	10.2	14.7	15
	208-3-60	18.9	146	1.3	5.0	0.0	NONE	0.0	0.0	29.9	45
							2CE04510525 ²	4.0	11.1	29.9	45
	230-3-60	18.9	146	1.3	5.0	0.0	NONE	0.0	0.0	29.9	45
							2CE04510725 ²	5.6	15.5	29.9	45
	460-3-60	9.5	73	0.8	2.5	0.0	NONE	0.0	0.0	29.9	45
							2CE04510746 ²	6.8	8.2	15.2	20
	575-3-60	7.6	58.4	0.8	2	0.0	NONE	0.0	0.0	15.2	20

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 23: ELECTRICAL DATA - DM036 & 048 DIRECT DRIVE WITH POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
3	208-1-60	18.0	105	1.3	4.4	10.0	NONE	0.0	0.0	38.2	50
							2CE04510506	4.0	19.2	42.0	50
							2CE04510706	5.6	26.9	51.7	60
							2CE04511006	8.0	38.5	66.1	70
							2CE04511506	11.9	57.2	89.5	90
							2CE04512006	15.9	76.4	113.6	125
	230-1-60	18.0	105	1.3	4.4	10.0	NONE	0.0	0.0	38.2	50
							2CE04510506	5.3	22.1	45.6	50
							2CE04510706	7.5	31.3	57.1	60
							2CE04511006	10.6	44.2	73.2	80
							2CE04511506	15.9	66.3	100.8	110
							2CE04512006	21.2	88.3	128.4	150
4	208-3-60	11.4	90	1.3	4.4	10.0	NONE	0.0	0.0	29.9	40
							2CE04510525 ²	4.0	11.1	31.9	40
							2CE04510725 ²	5.6	15.5	37.4	40
							2CE04511025	8.0	22.2	45.8	50
							2CE04511525	11.9	33.0	59.3	60
							2CE04512025	15.9	44.1	73.2	80
	230-3-60	11.4	90	1.3	4.4	10.0	NONE	0.0	0.0	29.9	40
							2CE04510525 ²	5.3	12.7	33.9	40
							2CE04510725 ²	7.5	18.0	40.6	45
							2CE04511025	10.6	25.5	49.9	50
							2CE04511525	15.9	38.2	65.8	70
							2CE04512025	21.2	51.0	81.7	90
5	460-3-60	6.2	45	0.8	2.2	5.0	NONE	0.0	0.0	15.8	20
							2CE04510746 ²	6.8	8.2	19.2	20
							2CE04511046 ²	10.1	12.1	24.2	25
							2CE04511546 ²	13.6	16.4	29.4	30
							2CE04512046 ²	19.5	23.5	38.3	40
	575-3-60	5.0	36	0.8	2.2	4.0	NONE	0.0	0.0	12.7	15
							2CE04511058	10.6	10.2	19.9	20
							2CE04511558	15.9	15.3	26.3	30
							2CE04512058	21.2	20.4	32.7	35
							NONE	0.0	0.0	46.8	70
6	208-1-60	24.4	140	1.3	5.0	10.0	2CE04510506	4.0	19.2	46.8	70
							2CE04510706	5.6	26.9	52.4	70
							2CE04511006	8.0	38.5	66.8	70
							2CE04511506	11.9	57.2	90.3	100
							2CE04512006	15.9	76.4	114.3	125
	230-1-60	24.4	140	1.3	5.0	10.0	NONE	0.0	0.0	46.8	70
							2CE04510506	5.3	22.1	46.8	70
							2CE04510706	7.5	31.3	57.8	70
							2CE04511006	10.6	44.2	74.0	80
							2CE04511506	15.9	66.3	101.6	110
							2CE04512006	21.2	88.3	129.2	150
7	208-3-60	14.1	105	1.3	5.0	10.0	NONE	0.0	0.0	33.9	45
							2CE04510525 ²	4.0	11.1	33.9	45
							2CE04510725 ²	5.6	15.5	38.2	45
							2CE04511025	8.0	22.2	46.5	50
							2CE04511525	11.9	33.0	60.0	70
	230-3-60	14.1	105	1.3	5.0	10.0	NONE	0.0	0.0	33.9	45
							2CE04510525 ²	5.3	12.7	34.7	45
							2CE04510725 ²	7.5	18.0	41.3	45
							2CE04511025	10.6	25.5	50.6	60
							2CE04511525	15.9	38.2	66.6	70
							2CE04512025	21.2	51.0	82.5	90
8	460-3-60	7.1	55	0.8	2.2	5.0	NONE	0.0	0.0	16.9	20
							2CE04510746 ²	6.8	8.2	19.2	20
							2CE04511046 ²	10.1	12.1	24.2	25
							2CE04511546 ²	13.6	16.4	29.4	30
							2CE04512046 ²	19.5	23.5	38.3	40
	575-3-60	5.8	44	0.8	2.2	4.0	NONE	0.0	0.0	13.7	15
							2CE04511058	10.6	10.2	19.9	20
							2CE04511558	15.9	15.3	26.3	30
							2CE04512058	21.2	20.4	32.7	35

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 24: ELECTRICAL DATA - DM060 & 072 DIRECT DRIVE WITH POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
5	208-1-60	28.9	165	1.3	6.6	10.0	NONE	0.0	0.0	54.0	80
							2CE04510506	4.0	19.2	54.0	80
	230-1-60	28.9	165	1.3	6.6	10.0	2CE04510706	5.6	26.9	54.4	80
							2CE04511006	8.0	38.5	68.8	80
	208-3-60	16.0	125	1.3	6.6	10.0	2CE04511506	11.9	57.2	92.3	100
							2CE04512006	15.9	76.4	116.3	125
	230-3-60	16.0	125	1.3	6.6	10.0	2CE04513006	22.2	106.7	154.2	175
							NONE	0.0	0.0	54.0	80
6	460-3-60	8.0	66.5	0.8	3.3	5.0	2CE04510525 ²	4.0	11.1	37.9	50
							2CE04510725 ²	5.6	22.1	54.0	80
	575-3-60	6.4	50	0.8	3.3	4.0	2CE04511025	7.5	31.3	59.8	80
							2CE04511525	10.6	44.2	76.0	80
	208-3-60	18.9	146	1.3	6.8	10.0	2CE04512025	15.9	66.3	103.6	110
							2CE04513025	21.2	88.3	131.2	150
	230-3-60	18.9	146	1.3	6.8	10.0	NONE	0.0	0.0	37.9	50
							2CE04510525 ²	5.3	12.7	37.9	50
	460-3-60	9.5	73	0.8	3.6	5.0	2CE04510725 ²	7.5	18.0	43.3	50
							2CE04511025	10.6	25.5	52.6	60
	575-3-60	7.6	58.4	0.8	3.6	4.0	2CE04511525	15.9	38.2	68.6	70
							2CE04512025	21.2	51.0	84.5	90

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 25: ELECTRICAL DATA - DM036 & 048 BELT DRIVE WITH POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
3	208-1-60	18.0	105	1.3	7.6	10.0	NONE 2CE04510506 2CE04510706 2CE04511006 2CE04511506 2CE04512006	0.0 4.0 5.6 8.0 11.9 15.9	0.0 19.2 26.9 38.5 57.2 76.4	41.4 46.0 55.7 70.1 93.5 117.6	50 50 60 80 100 125
	230-1-60	18.0	105	1.3	7.6	10.0	NONE 2CE04510506 2CE04510706 2CE04511006 2CE04511506 2CE04512006	0.0 5.3 7.5 10.6 15.9 21.2	0.0 22.1 31.3 44.2 66.3 88.3	41.4 49.6 61.1 77.2 104.8 132.4	50 50 70 80 110 150
	208-3-60	11.4	90	1.3	5.2	10.0	NONE 2CE04510525 ² 2CE04510725 ² 2CE04511025 2CE04511525 2CE04512025	0.0 4.0 5.6 8.0 11.9 15.9	0.0 11.1 15.5 22.2 33.0 44.1	30.8 32.9 38.4 46.8 60.3 74.2	40 40 40 50 70 80
	230-3-60	11.4	90	1.3	5.2	10.0	NONE 2CE04510525 ² 2CE04510725 ² 2CE04511025 2CE04511525 2CE04512025	0.0 5.3 7.5 10.6 15.9 21.2	0.0 12.7 18.0 25.5 38.2 51.0	30.8 34.9 41.6 50.9 66.8 82.7	40 40 45 60 70 90
	460-3-60	6.2	45	0.8	2.6	5.0	NONE 2CE04510746 ² 2CE04511046 ² 2CE04511546 ² 2CE04512046 ²	0.0 6.8 10.1 13.6 19.5	0.0 8.2 12.1 16.4 23.5	16.1 19.7 24.7 29.9 38.8	20 20 25 30 40
	575-3-60	5.0	36	0.8	2	4.0	NONE 2CE04511058 2CE04511558 2CE04512058	0.0 10.6 15.9 21.2	0.0 10.2 15.3 20.4	12.5 19.7 26.1 32.5	15 20 30 35
	208-1-60	24.4	140	1.3	7.6	10.0	NONE 2CE04510506 2CE04510706 2CE04511006 2CE04511506 2CE04512006	0.0 4.0 5.6 8.0 11.9 15.9	0.0 19.2 26.9 38.5 57.2 76.4	49.4 49.4 55.7 70.1 93.5 117.6	70 70 70 80 100 125
	230-1-60	24.4	140	1.3	7.6	10.0	NONE 2CE04510506 2CE04510706 2CE04511006 2CE04511506 2CE04512006	0.0 5.3 7.5 10.6 15.9 21.2	0.0 22.1 31.3 44.2 66.3 88.3	49.4 49.6 61.1 77.2 104.8 132.4	70 70 70 80 110 150
	208-3-60	14.1	105	1.3	5.2	10.0	NONE 2CE04510525 ² 2CE04510725 ² 2CE04511025 2CE04511525 2CE04512025	0.0 4.0 5.6 8.0 11.9 15.9	0.0 11.1 15.5 22.2 33.0 44.1	34.1 34.1 38.4 46.8 60.3 74.2	45 45 45 50 70 80
	230-3-60	14.1	105	1.3	5.2	10.0	NONE 2CE04510525 ² 2CE04510725 ² 2CE04511025 2CE04511525 2CE04512025	0.0 5.3 7.5 10.6 15.9 21.2	0.0 12.7 18.0 25.5 38.2 51.0	34.1 34.9 41.6 50.9 66.8 82.7	45 45 45 60 70 90
4	460-3-60	7.1	55	0.8	2.6	5.0	NONE 2CE04510746 ² 2CE04511046 ² 2CE04511546 ² 2CE04512046 ²	0.0 6.8 10.1 13.6 19.5	0.0 8.2 12.1 16.4 23.5	17.3 19.7 24.7 29.9 38.8	20 20 25 30 40
	575-3-60	5.8	44	0.8	2	4.0	NONE 2CE04511058 2CE04511558 2CE04512058	0.0 10.6 15.9 21.2	0.0 10.2 15.3 20.4	13.5 19.7 26.1 32.5	15 20 30 35

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 26: ELECTRICAL DATA - DM060 & 072 BELT DRIVE WITH POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps					
		RLA Each	LRA Each													
5	208-1-60	28.9	165	1.3	7.6	10.0	NONE	0.0	0.0	55.0	80					
							2CE04510506	4.0	19.2	55.0	80					
							2CE04510706	5.6	26.9	55.7	80					
							2CE04511006	8.0	38.5	70.1	80					
							2CE04511506	11.9	57.2	93.5	100					
							2CE04512006	15.9	76.4	117.6	125					
	230-1-60						2CE04513006	22.2	106.7	155.4	175					
							NONE	0.0	0.0	55.0	80					
							2CE04510506	5.3	22.1	55.0	80					
							2CE04510706	7.5	31.3	61.1	80					
6	208-3-60	16.0	125	1.3	5.2	10.0	2CE04511006	10.6	44.2	77.2	80					
							2CE04511506	15.9	66.3	104.8	110					
							2CE04512006	21.2	88.3	132.4	150					
							2CE04513006	29.6	123.3	176.2	200					
							NONE	0.0	0.0	36.5	50					
	230-3-60						2CE04510525 ²	4.0	11.1	36.5	50					
							2CE04510725 ²	5.6	15.5	38.4	50					
							2CE04511025	8.0	22.2	46.8	50					
							2CE04511525	11.9	33.0	60.3	70					
							2CE04512025	15.9	44.1	74.2	80					
7	460-3-60	8.0	66.5	0.8	2.6	5.0	2CE04513025	22.2	61.6	96.0	100					
							NONE	0.0	0.0	36.5	50					
							2CE04510525 ²	5.3	12.7	36.5	50					
							2CE04510725 ²	7.5	18.0	41.6	50					
							2CE04511025	10.6	25.5	50.9	60					
	575-3-60						2CE04511525	15.9	38.2	66.8	70					
							2CE04512025	21.2	51.0	82.7	90					
							2CE04513025	29.6	71.2	108.0	110					
							NONE	0.0	0.0	18.4	25					
							2CE04510746 ²	6.8	8.2	19.7	25					
8	208-3-60	6.4	50	0.8	2	4.0	2CE04510946 ²	10.1	12.1	24.7	25					
							2CE04511146 ²	13.6	16.4	29.9	30					
							2CE04511546 ²	19.5	23.5	38.8	40					
							2CE04512046 ²	28.8	34.6	52.8	60					
							NONE	0.0	0.0	14.2	20					
	575-3-60						2CE04511058	10.6	10.2	19.7	20					
							2CE04511558	15.9	15.3	26.1	30					
							2CE04512058	21.2	20.4	32.5	35					
							2CE04513058	30.4	29.3	43.6	45					
							NONE	0.0	0.0	39.9	50					
9	208-3-60	18.9	146	1.3	5.0	10.0	2CE04510525 ²	4.0	11.1	39.9	50					
							2CE04510725 ²	5.6	15.5	39.9	50					
							2CE04511025	8.0	22.2	46.5	50					
							2CE04511525	11.9	33.0	60.0	70					
							2CE04512025	15.9	44.1	73.9	80					
	230-3-60						2CE04513025	22.2	61.6	95.8	100					
							NONE	0.0	0.0	39.9	50					
							2CE04510525 ²	5.3	12.7	39.9	50					
							2CE04510725 ²	7.5	18.0	41.3	50					
							2CE04511025	10.6	25.5	50.6	60					
10	460-3-60	9.5	73	0.8	2.5	5.0	2CE04511525	15.9	38.2	66.6	70					
							2CE04512025	21.2	51.0	82.5	90					
							2CE04513025	29.6	71.2	107.8	110					
							NONE	0.0	0.0	20.2	25					
							2CE04510746 ²	6.8	8.2	20.2	25					
	575-3-60						2CE04511046 ²	10.1	12.1	24.6	25					
							2CE04511546 ²	13.6	16.4	29.8	30					
							2CE04512046 ²	19.5	23.5	38.7	40					
							2CE04513046 ²	28.8	34.6	52.7	60					
							NONE	0.0	0.0	15.7	20					

1. HACR Type per NEC.
2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 27: ELECTRICAL DATA - DF036 & 048 DIRECT DRIVE WITHOUT POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
3	208-1-60	16.7	87	2.3	4.4	0.0	NONE	0.0	0.0	27.5	45
							2CE04510506	4.0	19.2	30.7	45
							2CE04510706	5.6	26.9	39.2	45
							2CE04511006	8.0	38.5	53.6	60
							2CE04511506	11.9	57.2	77.0	80
							2CE04512006	15.9	76.4	101.1	110
	230-1-60	16.7	87	2.3	4.4	0.0	NONE	0.0	0.0	27.5	45
							2CE04510506	5.3	22.1	33.1	45
							2CE04510706	7.5	31.3	44.6	45
							2CE04511006	10.6	44.2	60.7	70
							2CE04511506	15.9	66.3	88.3	90
4	208-3-60	13.1	110	2.3	4.4	0.0	NONE	0.0	0.0	23.1	35
							2CE045105252	4.0	11.1	24.3	35
							2CE045107252	5.6	15.5	24.9	35
							2CE04511025	8.0	22.2	33.3	35
							2CE04511525	11.9	33.0	46.8	50
							2CE04512025	15.9	44.1	60.7	70
	230-3-60	13.1	110	2.3	4.4	0.0	NONE	0.0	0.0	23.1	35
							2CE045105252	5.3	12.7	24.3	35
							2CE045107252	7.5	18.0	28.1	35
							2CE04511025	10.6	25.5	37.4	40
							2CE04511525	15.9	38.2	53.3	60
	460-3-60	6.7	54	1.3	2.2	0.0	NONE	0.0	0.0	12.0	15
							2CE045107462	6.8	8.2	13.0	15
							2CE045110462	10.1	12.1	17.9	20
							2CE045115462	13.6	16.4	23.2	25
							2CE045120462	19.5	23.5	32.1	35
575-3-60	575-3-60	5.1	44	1.3	2.2	0.0	NONE	0.0	0.0	10.7	15
							2CE04511058	10.6	10.2	14.9	15
							2CE04511558	15.9	15.3	21.3	25
							2CE04512058	21.2	20.4	27.7	30
							NONE	0.0	0.0	38.5	60
	208-1-60	25.0	135	2.3	5.0	0.0	2CE04510506	4.0	19.2	38.5	60
							2CE04510706	5.6	26.9	39.9	60
							2CE04511006	8.0	38.5	54.3	60
							2CE04511506	11.9	57.2	77.8	80
							2CE04512006	15.9	76.4	101.8	110
4	230-1-60	25.0	135	2.3	5.0	0.0	NONE	0.0	0.0	38.5	60
							2CE04510506	5.3	22.1	38.5	60
							2CE04510706	7.5	31.3	45.3	60
							2CE04511006	10.6	44.2	61.5	70
							2CE04511506	15.9	66.3	89.1	90
	208-3-60	14.7	130	2.3	5.0	0.0	NONE	0.0	0.0	25.7	40
							2CE045105252	4.0	11.1	25.7	40
							2CE045107252	5.6	15.5	25.7	40
							2CE04511025	8.0	22.2	34.0	40
							2CE04511525	11.9	33.0	47.5	50
575-3-60	230-3-60	14.7	130	2.3	5.0	0.0	NONE	0.0	0.0	25.7	40
							2CE045105252	5.3	12.7	25.7	40
							2CE045107252	7.5	18.0	28.8	40
							2CE04511025	10.6	25.5	38.1	40
							2CE04511525	15.9	38.2	54.1	60
4	460-3-60	7.7	64	1.3	2.2	0.0	NONE	0.0	0.0	13.1	20
							2CE045107462	6.8	8.2	13.1	20
							2CE045110462	10.1	12.1	17.9	20
							2CE045115462	13.6	16.4	23.2	25
							2CE045120462	19.5	23.5	32.1	35
575-3-60	575-3-60	6.4	52	1.3	2.2	0.0	NONE	0.0	0.0	10.8	15
							2CE04511058	10.6	10.2	14.9	15
							2CE04511558	15.9	15.3	21.3	25
							2CE04512058	21.2	20.4	27.7	30

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 28: ELECTRICAL DATA - DF060 DIRECT DRIVE WITHOUT POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
5	208-1-60	32.1	148	2.3	6.6	0.0	NONE	0.0	0.0	49.0	80
							2CE04510506	4.0	19.2	49.0	80
	230-1-60	32.1	148	2.3	6.6	0.0	2CE04510706	5.6	26.9	49.0	80
							2CE04511006	8.0	38.5	56.3	80
	208-3-60	19.3	123	2.3	6.6	0.0	2CE04511506	11.9	57.2	79.8	80
							2CE04512006	15.9	76.4	103.8	110
5	230-3-60	19.3	123	2.3	6.6	0.0	2CE04513006	22.2	106.7	141.7	150
							NONE	0.0	0.0	49.0	80
	460-3-60	9.1	62	1.3	3.3	0.0	2CE04510525 ²	4.0	11.1	33.0	50
							2CE04510725 ²	5.6	15.5	33.0	50
	575-3-60	7.9	50	1.3	3.3	0.0	2CE04511025	8.0	22.2	36.0	50
							2CE04511525	11.9	33.0	49.5	50
							2CE04512025	15.9	44.1	63.4	70
							2CE04513025	22.2	61.6	85.3	90

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 29: ELECTRICAL DATA - DF036 & 048 BELT DRIVE WITHOUT POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
3	208-1-60	16.7	87	2.3	7.6	0.0	NONE	0.0	0.0	30.1	50
							2CE04510506	4.0	19.2	33.9	50
							2CE04510706	5.6	26.9	43.2	50
							2CE04511006	8.0	38.5	57.6	60
							2CE04511506	11.9	57.2	81.0	90
							2CE04512006	15.9	76.4	105.1	110
	230-1-60	16.7	87	2.3	7.6	0.0	NONE	0.0	0.0	30.1	50
							2CE04510506	5.3	22.1	37.1	50
							2CE04510706	7.5	31.3	48.6	50
							2CE04511006	10.6	44.2	64.7	70
							2CE04511506	15.9	66.3	92.3	100
4	208-3-60	13.1	110	2.3	5.2	0.0	NONE	0.0	0.0	23.9	35
							2CE04510525 ²	4.0	11.1	25.1	35
							2CE04510725 ²	5.6	15.5	25.9	35
							2CE04511025	8.0	22.2	34.3	35
							2CE04511525	11.9	33.0	47.8	50
							2CE04512025	15.9	44.1	61.7	70
	230-3-60	13.1	110	2.3	5.2	0.0	NONE	0.0	0.0	23.9	35
							2CE04510525	5.3	12.7	25.1	35
							2CE04510725	7.5	18.0	29.1	35
							2CE04511025	10.6	25.5	38.4	40
							2CE04511525	15.9	38.2	54.3	60
	460-3-60	6.7	54	1.3	2.6	0.0	NONE	0.0	0.0	12.4	15
							2CE04510746 ²	6.8	8.2	13.5	15
							2CE04511046 ²	10.1	12.1	18.4	20
							2CE04511546 ²	13.6	16.4	23.7	25
							2CE04512046 ²	19.5	23.5	32.6	35
5	575-3-60	5.1	44	1.3	2	0.0	NONE	0.0	0.0	9.8	15
							2CE04511058	10.6	10.2	14.7	15
							2CE04511558	15.9	15.3	21.1	25
							2CE04512058	21.2	20.4	27.5	30
							NONE	0.0	0.0	41.2	60
	208-1-60	25.0	135	2.3	7.6	0.0	2CE04510506	4.0	19.2	41.2	60
							2CE04510706	5.6	26.9	43.2	60
							2CE04511006	8.0	38.5	57.6	60
							2CE04511506	11.9	57.2	81.0	90
							2CE04512006	15.9	76.4	105.1	110
6	230-1-60	25.0	135	2.3	7.6	0.0	NONE	0.0	0.0	41.2	60
							2CE04510506	5.3	22.1	41.2	60
							2CE04510706	7.5	31.3	48.6	60
							2CE04511006	10.6	44.2	64.7	70
							2CE04511506	15.9	66.3	92.3	100
	208-3-60	14.7	130	2.3	5.2	0.0	NONE	0.0	0.0	25.9	40
							2CE04510525 ²	4.0	11.1	25.9	40
							2CE04510725 ²	5.6	15.5	25.9	40
							2CE04511025	8.0	22.2	34.3	40
							2CE04511525	11.9	33.0	47.8	50
7	230-3-60	14.7	130	2.3	5.2	0.0	NONE	0.0	0.0	25.9	40
							2CE04510525 ²	5.3	12.7	25.9	40
							2CE04510725 ²	7.5	18.0	29.1	40
							2CE04511025	10.6	25.5	38.4	40
							2CE04511525	15.9	38.2	54.3	60
8	460-3-60	7.7	64	1.3	2.6	0.0	NONE	0.0	0.0	13.5	20
							2CE04510746 ²	6.8	8.2	13.5	20
							2CE04511046 ²	10.1	12.1	18.4	20
							2CE04511546 ²	13.6	16.4	23.7	25
							2CE04512046 ²	19.5	23.5	32.6	35
9	575-3-60	6.4	52	1.3	2	0.0	NONE	0.0	0.0	10.6	15
							2CE04511058	10.6	10.2	14.7	15
							2CE04511558	15.9	15.3	21.1	25
							2CE04512058	21.2	20.4	27.5	30

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 30: ELECTRICAL DATA - DF060 BELT DRIVE WITHOUT POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
5	208-1-60	32.1	148	2.3	7.6	0.0	NONE	0.0	0.0	50.0	80
							2CE04510506	4.0	19.2	50.0	80
	230-1-60	32.1	148	2.3	7.6	0.0	2CE04510706	5.6	26.9	50.0	80
							2CE04511006	8.0	38.5	57.6	80
	208-3-60	19.3	123	2.3	5.2	0.0	2CE04511506	11.9	57.2	81.0	90
							2CE04512006	15.9	76.4	105.1	110
	230-3-60	19.3	123	2.3	5.2	0.0	2CE04513006	22.2	106.7	142.9	150
							NONE	0.0	0.0	50.0	80
	460-3-60	9.1	62	1.3	2.6	0.0	2CE04510525 ²	4.0	11.1	31.6	50
							2CE04510725 ²	5.6	15.5	31.6	50
	575-3-60	7.9	50	1.3	2	0.0	2CE04511025	8.0	22.2	34.3	50
							2CE04511525	11.9	33.0	47.8	50
							2CE04512025	15.9	44.1	61.7	70
							2CE04513025	22.2	61.6	83.5	90

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 31: ELECTRICAL DATA - DF072 BELT DRIVE WITHOUT POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motors FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No. ³	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
6	208-3-60	18.6	156	2.3	5.2	0.0	NONE	0.0	0.0	30.8	45
							2CE04510525 ²	4.0	11.1	30.8	45
							2CE04510725 ²	5.6	15.5	30.8	45
							2CE04511025	8.0	22.2	34.1	45
							2CE04511525	11.9	33.0	47.9	50
							2CE04512025	15.9	44.1	61.7	70
	230-3-60	18.6	156	2.3	5.2	0.0	NONE	0.0	0.0	30.8	45
							2CE04510525 ²	5.3	12.7	30.8	45
							2CE04510725 ²	7.5	18.0	30.8	45
							2CE04511025	10.6	25.5	38.4	45
							2CE04511525	15.9	38.2	54.3	60
							2CE04512025	21.2	51.0	70.2	80
	460-3-60	9.0	75	1.3	2.6	0.0	NONE	0.0	0.0	15.2	20
							2CE04510746 ²	6.8	8.2	15.2	20
							2CE04511046 ²	10.1	12.1	18.4	20
							2CE04511546 ²	13.6	16.4	23.7	25
							2CE04512046 ²	19.5	23.5	32.6	35
							2CE04513046 ²	28.8	34.6	46.6	50
	573-3-60	7.4	54	1.3	2.0	0.0	NONE	0.0	0.0	12.6	15
							2CE04511058	10.6	10.2	15.2	20
							2CE04511558	15.9	15.3	21.6	25
							2CE04512058	21.2	20.4	28.0	30
							2CE04513058	30.4	29.3	39.1	40

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code, the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 32: ELECTRICAL DATA - DF036 & 048 DIRECT DRIVE WITH POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
3	208-1-60	16.7	87	2.3	4.4	10.0	NONE	0.0	0.0	37.5	50
							2CE04510506	4.0	19.2	42.0	50
							2CE04510706	5.6	26.9	51.7	60
							2CE04511006	8.0	38.5	66.1	70
							2CE04511506	11.9	57.2	89.5	90
							2CE04512006	15.9	76.4	113.6	125
	230-1-60	16.7	87	2.3	4.4	10.0	NONE	0.0	0.0	37.5	50
							2CE04510506	5.3	22.1	45.6	50
							2CE04510706	7.5	31.3	57.1	60
							2CE04511006	10.6	44.2	73.2	80
							2CE04511506	15.9	66.3	100.8	110
							2CE04512006	21.2	88.3	128.4	150
4	208-3-60	13.1	110	2.3	4.4	10.0	NONE	0.0	0.0	33.4	45
							2CE04510525 ²	4.0	11.1	34.3	45
							2CE04510725 ²	5.6	15.5	37.4	45
							2CE04511025	8.0	22.2	45.8	50
							2CE04511525	11.9	33.0	59.3	60
							2CE04512025	15.9	44.1	73.2	80
	230-3-60	13.1	110	2.3	4.4	10.0	NONE	0.0	0.0	33.4	45
							2CE04510525	5.3	12.7	34.3	45
							2CE04510725 ²	7.5	18.0	40.6	45
							2CE04511025	10.6	25.5	49.9	50
							2CE04511525	15.9	38.2	65.8	70
							2CE04512025	21.2	51.0	81.7	90
5	460-3-60	6.7	54	1.3	2.2	5.0	NONE	0.0	0.0	17.1	20
							2CE04510746 ²	6.8	8.2	19.2	20
							2CE04511046 ²	10.1	12.1	24.2	25
							2CE04511546 ²	13.6	16.4	29.4	30
							2CE04512046 ²	19.5	23.5	38.3	40
	575-3-60	5.1	44	1.3	2.2	4.0	NONE	0.0	0.0	12.9	15
							2CE04511058	10.6	10.2	19.9	20
							2CE04511558	15.9	15.3	26.3	30
							2CE04512058	21.2	20.4	32.7	35
							NONE	0.0	0.0	48.5	70
6	208-1-60	25.0	135	2.3	5.0	10.0	2CE04510506	4.0	19.2	48.5	70
							2CE04510706	5.6	26.9	52.4	70
							2CE04511006	8.0	38.5	66.8	70
							2CE04511506	11.9	57.2	90.3	100
							2CE04512006	15.9	76.4	114.3	125
	230-1-60	25.0	135	2.3	5.0	10.0	NONE	0.0	0.0	48.5	70
							2CE04510506	5.3	22.1	48.5	70
							2CE04510706	7.5	31.3	57.8	70
							2CE04511006	10.6	44.2	74.0	80
							2CE04511506	15.9	66.3	101.6	110
							2CE04512006	21.2	88.3	129.2	150
7	208-3-60	14.7	130	2.3	5.0	10.0	NONE	0.0	0.0	35.7	50
							2CE04510525 ²	4.0	11.1	35.7	50
							2CE04510725 ²	5.6	15.5	38.2	50
							2CE04511025	8.0	22.2	46.5	50
							2CE04511525	11.9	33.0	60.0	70
	230-3-60	14.7	130	2.3	5.0	10.0	NONE	0.0	0.0	35.7	50
							2CE04510525 ²	5.3	12.7	35.7	50
							2CE04510725 ²	7.5	18.0	41.3	50
							2CE04511025	10.6	25.5	50.6	60
							2CE04511525	15.9	38.2	66.6	70
							2CE04512025	21.2	51.0	82.5	90
8	460-3-60	7.7	64	1.3	2.2	5.0	NONE	0.0	0.0	18.1	25
							2CE04510746 ²	6.8	8.2	19.2	25
							2CE04511046 ²	10.1	12.1	24.2	25
							2CE04511546 ²	13.6	16.4	29.4	30
							2CE04512046 ²	19.5	23.5	38.3	40
	575-3-60	6.4	52	1.3	2.2	4.0	NONE	0.0	0.0	14.8	20
							2CE04511058	10.6	10.2	19.9	20
							2CE04511558	15.9	15.3	26.3	30
							2CE04512058	21.2	20.4	32.7	35

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 33: ELECTRICAL DATA - DF060 DIRECT DRIVE WITH POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
5	208-1-60	32.1	148	2.3	6.6	10.0	NONE	0.0	0.0	59.0	90
							2CE04510506	4.0	19.2	59.0	90
							2CE04510706	5.6	26.9	59.0	90
							2CE04511006	8.0	38.5	68.8	90
							2CE04511506	11.9	57.2	92.3	100
							2CE04512006	15.9	76.4	116.3	125
							2CE04513006	22.2	106.7	154.2	175
							NONE	0.0	0.0	59.0	90
							2CE04510506	5.3	22.1	59.0	90
							2CE04510706	7.5	31.3	59.8	90
	230-1-60	32.1	148	2.3	6.6	10.0	2CE04511006	10.6	44.2	76.0	90
							2CE04511506	15.9	66.3	103.6	110
							2CE04512006	21.2	88.3	131.2	150
							2CE04513006	29.6	123.3	174.9	175
	208-3-60	19.3	123	2.3	6.6	10.0	NONE	0.0	0.0	43.0	60
							2CE04510525 ²	4.0	11.1	43.0	60
							2CE04510725 ²	5.6	15.5	43.0	60
							2CE04511025	8.0	22.2	48.5	60
							2CE04511525	11.9	33.0	62.0	70
							2CE04512025	15.9	44.1	75.9	80
							2CE04513025	22.2	61.6	97.8	100
	230-3-60	19.3	123	2.3	6.6	10.0	NONE	0.0	0.0	43.0	60
							2CE04510525 ²	5.3	12.7	43.0	60
							2CE04510725 ²	7.5	18.0	43.3	60
							2CE04511025	10.6	25.5	52.6	60
							2CE04511525	15.9	38.2	68.6	70
							2CE04512025	21.2	51.0	84.5	90
							2CE04513025	29.6	71.2	109.8	110
	460-3-60	9.1	62	1.3	3.3	5.0	NONE	0.0	0.0	21.0	30
							2CE04510746 ²	6.8	8.2	21.0	30
							2CE04511046 ²	10.1	12.1	25.6	30
							2CE04511546 ²	13.6	16.4	30.8	35
							2CE04512046 ²	19.5	23.5	39.7	40
							2CE04513046 ²	28.8	34.6	53.7	60
	575-3-60	7.9	50	1.3	3.3	4.0	NONE	0.0	0.0	17.6	20
							2CE04511058	10.6	10.2	21.0	25
							2CE04511558	15.9	15.3	27.4	30
							2CE04512058	21.2	20.4	33.8	35
							2CE04513058	30.4	29.3	44.9	45

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 34: ELECTRICAL DATA - DF036 & 048 BELT DRIVE WITH POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
3	208-1-60	16.7	87	2.3	7.6	10.0	NONE	0.0	0.0	41.0	60
							2CE04510506	4.0	19.2	46.0	60
							2CE04510706	5.6	26.9	55.7	60
							2CE04511006	8.0	38.5	70.1	80
							2CE04511506	11.9	57.2	93.5	100
							2CE04512006	15.9	76.4	117.6	125
	230-1-60	16.7	87	2.3	7.6	10.0	NONE	0.0	0.0	41.0	60
							2CE04510506	5.3	22.1	49.6	60
							2CE04510706	7.5	31.3	61.1	70
							2CE04511006	10.6	44.2	77.2	80
							2CE04511506	15.9	66.3	104.8	110
4	208-3-60	13.1	110	2.3	5.2	10.0	NONE	0.0	0.0	34.4	45
							2CE045105252	4.0	11.1	35.1	45
							2CE045107252	5.6	15.5	38.4	45
							2CE04511025	8.0	22.2	46.8	50
							2CE04511525	11.9	33.0	60.3	70
							2CE04512025	15.9	44.1	74.2	80
	230-3-60	13.1	110	2.3	5.2	10.0	NONE	0.0	0.0	34.4	45
							2CE04510525	5.3	12.7	35.1	45
							2CE045107252	7.5	18.0	41.6	45
							2CE04511025	10.6	25.5	50.9	60
							2CE04511525	15.9	38.2	66.8	70
	460-3-60	6.7	54	1.3	2.6	5.0	NONE	0.0	0.0	17.6	20
							2CE045107462	6.8	8.2	19.7	20
							2CE045110462	10.1	12.1	24.7	25
							2CE045115462	13.6	16.4	29.9	30
							2CE045120462	19.5	23.5	38.8	40
575-3-60	575-3-60	5.1	44	1.3	2	4.0	NONE	0.0	0.0	14.0	15
							2CE04511058	10.6	10.2	19.7	20
							2CE04511558	15.9	15.3	26.1	30
							2CE04512058	21.2	20.4	32.5	35
							NONE	0.0	0.0	51.2	70
	208-1-60	25.0	135	2.3	7.6	10.0	2CE04510506	4.0	19.2	51.2	70
							2CE04510706	5.6	26.9	55.7	70
							2CE04511006	8.0	38.5	70.1	80
							2CE04511506	11.9	57.2	93.5	100
							2CE04512006	15.9	76.4	117.6	125
4	230-1-60	25.0	135	2.3	7.6	10.0	NONE	0.0	0.0	51.2	70
							2CE04510506	5.3	22.1	51.2	70
							2CE04510706	7.5	31.3	61.1	70
							2CE04511006	10.6	44.2	77.2	80
							2CE04511506	15.9	66.3	104.8	110
	208-3-60	14.7	130	2.3	5.2	10.0	NONE	0.0	0.0	35.9	50
							2CE045105252	4.0	11.1	35.9	50
							2CE045107252	5.6	15.5	38.4	50
							2CE04511025	8.0	22.2	46.8	50
							2CE04511525	11.9	33.0	60.3	70
	230-3-60	14.7	130	2.3	5.2	10.0	NONE	0.0	0.0	35.9	50
							2CE045105252	5.3	12.7	35.9	50
							2CE045107252	7.5	18.0	41.6	50
							2CE04511025	10.6	25.5	50.9	60
							2CE04511525	15.9	38.2	66.8	70
	460-3-60	7.7	64	1.3	2.6	5.0	NONE	0.0	0.0	18.5	25
							2CE045107462	6.8	8.2	19.7	25
							2CE045110462	10.1	12.1	24.7	25
							2CE045115462	13.6	16.4	29.9	30
							2CE045120462	19.5	23.5	38.8	40
	575-3-60	6.4	52	1.3	2	4.0	NONE	0.0	0.0	14.6	20
							2CE04511058	10.6	10.2	19.7	20
							2CE04511558	15.9	15.3	26.1	30
							2CE04512058	21.2	20.4	32.5	35

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 35: ELECTRICAL DATA - DF060 BELT DRIVE WITH POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
5	208-1-60	32.1	148	2.3	7.6	10.0	NONE	0.0	0.0	60.0	90
							2CE04510506	4.0	19.2	60.0	90
	230-1-60	32.1	148	2.3	7.6	10.0	2CE04510706	5.6	26.9	60.0	90
							2CE04511006	8.0	38.5	70.1	90
	208-3-60	19.3	123	2.3	5.2	10.0	2CE04511506	11.9	57.2	93.5	100
							2CE04512006	15.9	76.4	117.6	125
	230-3-60	19.3	123	2.3	5.2	10.0	2CE04513006	22.2	106.7	155.4	175
							NONE	0.0	0.0	60.0	90
	460-3-60	9.1	62	1.3	2.6	5.0	2CE04510525 ²	5.3	22.1	60.0	90
							2CE04510725 ²	7.5	31.3	61.1	90
	575-3-60	7.9	50	1.3	2	4.0	2CE04511025	10.6	44.2	77.2	90
							2CE04511525	15.9	66.3	104.8	110
							2CE04512025	21.2	88.3	132.4	150
							2CE04513025	29.6	123.3	176.2	200

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 36: ELECTRICAL DATA - DF072 BELT DRIVE WITH POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motors FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No. ³	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
6	208-3-60	18.6	156	2.3	5.2	10.0	NONE	0.0	0.0	40.8	50
							2CE04510525 ²	4.0	11.1	40.8	50
	230-3-60	18.6	156	2.3	5.2	10.0	2CE04510725 ²	5.6	15.5	40.8	50
							2CE04511025	8.0	22.2	46.6	50
460	460-3-60	9.0	75	1.3	2.6	5.0	NONE	0.0	0.0	40.8	50
							2CE04510746 ²	6.8	8.2	20.2	25
	573-3-60	7.4	54	1.3	2.0	4.0	2CE04511046 ²	10.1	12.1	24.7	25
							2CE04511546 ²	13.6	16.4	29.9	30
573	573-3-60	7.4	54	1.3	2.0	4.0	2CE04512046 ²	19.5	23.5	38.8	40
							2CE04513046 ²	28.8	34.6	52.8	60
	573-3-60	7.4	54	1.3	2.0	4.0	NONE	0.0	0.0	16.6	20
							2CE04511058	10.6	10.2	20.2	25
573	573-3-60	7.4	54	1.3	2.0	4.0	2CE04511558	15.9	15.3	26.6	30
							2CE04512058	21.2	20.4	33.0	35
	573-3-60	7.4	54	1.3	2.0	4.0	2CE04513058	30.4	29.3	44.1	45

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 37: ELECT DATA - DH036, 048 & 060 BELT DRIVE WITHOUT POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps					
		RLA Each	LRA Each													
3	208-3-60	13.1	110	2.3	5.2	0.0	NONE	0.0	0.0	23.9	35					
							2CE04510525 ²	4.0	11.1	23.9	35					
							2CE04510725 ²	5.6	15.5	25.9	35					
	230-3-60						2CE04511025	8.0	22.2	34.3	35					
							2CE04511525	11.9	33.0	47.8	50					
							2CE04512025	15.9	44.1	61.7	70					
4	208-3-60	13.1	110	2.3	5.2	0.0	NONE	0.0	0.0	23.9	35					
							2CE04510525 ²	4.0	11.1	25.1	35					
							2CE04510725 ²	5.6	15.5	25.9	35					
	230-3-60						2CE04511025	8.0	22.2	34.3	35					
							2CE04511525	11.9	33.0	47.8	50					
							2CE04512025	15.9	44.1	61.7	70					
5	208-3-60	16.0	137	2.3	5.2	0.0	NONE	0.0	0.0	23.9	35					
							2CE04510525 ²	4.0	11.1	25.1	35					
							2CE04510725 ²	5.6	15.5	27.5	40					
	230-3-60						2CE04511025	8.0	22.2	34.3	40					
							2CE04511525	11.9	33.0	47.8	50					
							2CE04512025	15.9	44.1	61.7	70					
5	460-3-60	6.7	54	1.3	2.6	0.0	NONE	0.0	0.0	12.4	15					
							2CE04510746 ²	6.8	8.2	13.5	15					
							2CE04511046 ²	10.1	12.1	18.4	20					
	460-3-60						2CE04511546 ²	13.6	16.4	23.7	25					
							2CE04512046 ²	19.5	23.5	32.6	35					
							NONE	0.0	0.0	11.3	15					
5	575-3-60	5.1	44	1.3	2	0.0	2CE04511058	10.6	10.2	14.7	15					
							2CE04511558	15.9	15.3	21.1	25					
							2CE04512058	21.2	20.4	27.5	30					
	575-3-60						NONE	0.0	0.0	28.3	40					
							2CE04510525 ²	4.0	11.1	27.5	40					
							2CE04510725 ²	5.6	15.5	27.5	40					
5	208-3-60	16.0	137	2.3	5.2	0.0	2CE04511025	8.0	22.2	34.3	40					
							2CE04511525	11.9	33.0	47.8	50					
							2CE04512025	15.9	44.1	61.7	70					
	230-3-60						2CE04513025	22.2	61.6	83.5	90					
							NONE	0.0	0.0	28.3	40					
							2CE04510525 ²	5.3	12.7	27.5	40					
5	460-3-60	8.3	69	1.3	2.6	0.0	2CE04510725 ²	7.5	18.0	29.1	40					
							2CE04511025	10.6	25.5	38.4	40					
							2CE04511525	15.9	38.2	54.3	60					
	460-3-60						2CE04512025	21.2	51.0	70.2	80					
							2CE04513025	29.6	71.2	95.5	100					
							NONE	0.0	0.0	13.4	20					
5	575-3-60	6.4	58	1.3	2	0.0	2CE04510746 ²	6.8	8.2	14.3	20					
							2CE04511046 ²	10.1	12.1	18.4	20					
							2CE04511546 ²	13.6	16.4	23.7	25					
	575-3-60						2CE04512046 ²	19.5	23.5	32.6	35					
							2CE04513046 ²	28.8	34.6	46.6	50					
							NONE	0.0	0.0	9.7	15					
5	575-3-60	6.4	58	1.3	2	0.0	2CE04511058	10.6	10.2	14.7	15					
							2CE04511558	15.9	15.3	21.1	25					
							2CE04512058	21.2	20.4	27.5	30					
	575-3-60						2CE04513058	30.4	29.3	38.6	40					

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 38: ELECT DATA - DH036, 048 & 060 BELT DRIVE WITH POWR'D CONVENIENCE OUTLET

Model Tonnage	Voltage	Compressors		OD Fan Motor FLA	ID Blower Motor FLA	Conv Outlet Amps	Electric Heater Model No.	Heater kW	Heater Amps	Minimum Circuit Ampacity Amps	Max Fuse / BRKR ¹ Size Amps
		RLA Each	LRA Each								
3	208-3-60	13.1	110	2.3	5.2	10.0	NONE	0.0	0.0	33.9	45
							2CE04510525 ²	4.0	11.1	33.9	45
	230-3-60	13.1	110	2.3	5.2	10.0	NONE	0.0	0.0	33.9	45
							2CE04510725 ²	5.6	15.5	38.4	45
	460-3-60	6.4	54	1.3	2.6	5.0	NONE	0.0	0.0	16.9	20
							2CE04510746 ²	6.8	8.2	19.7	20
4	208-3-60	13.1	110	2.3	5.2	10.0	NONE	0.0	0.0	34.4	45
							2CE04510525 ²	4.0	11.1	35.1	45
	230-3-60	13.1	110	2.3	5.2	10.0	NONE	0.0	0.0	34.4	45
							2CE04510725 ²	5.6	15.5	38.4	45
	460-3-60	6.7	54	1.3	2.6	5.0	NONE	0.0	0.0	17.6	20
							2CE04510746 ²	6.8	8.2	19.7	20
5	208-3-60	16.0	137	2.3	5.2	10.0	NONE	0.0	0.0	15.3	15
							2CE04511058	10.6	10.2	19.7	20
	230-3-60	16.0	137	2.3	5.2	10.0	NONE	0.0	0.0	15.3	15
							2CE04511064 ²	10.1	12.1	24.7	25
	460-3-60	8.3	69	1.3	2.6	5.0	NONE	0.0	0.0	18.4	25
							2CE04511046 ²	6.8	8.2	19.7	25
575-3-60	575-3-60	6.4	44	1.3	2	4.0	NONE	0.0	0.0	15.3	15
							2CE04511058	10.6	10.2	19.7	20
	208-3-60	16.0	137	2.3	5.2	10.0	NONE	0.0	0.0	38.3	50
							2CE04510525 ²	4.0	11.1	37.5	50
	230-3-60	16.0	137	2.3	5.2	10.0	NONE	0.0	0.0	38.3	50
							2CE04510725 ²	5.6	15.5	38.4	50
575-3-60	460-3-60	8.3	69	1.3	2.6	5.0	NONE	0.0	0.0	18.4	25
							2CE04511046 ²	10.1	12.1	24.7	25
	575-3-60	6.4	58	1.3	2	4.0	NONE	0.0	0.0	15.3	20
							2CE04511058	10.6	10.2	19.7	20
	575-3-60	6.4	58	1.3	2	4.0	NONE	0.0	0.0	26.1	30
							2CE04511064 ²	15.9	15.3	26.1	30
	575-3-60	6.4	58	1.3	2	4.0	NONE	0.0	0.0	32.5	35
							2CE04512058	21.2	20.4	32.5	35
	575-3-60	6.4	58	1.3	2	4.0	NONE	0.0	0.0	43.6	45

1. HACR Type per NEC.

2. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

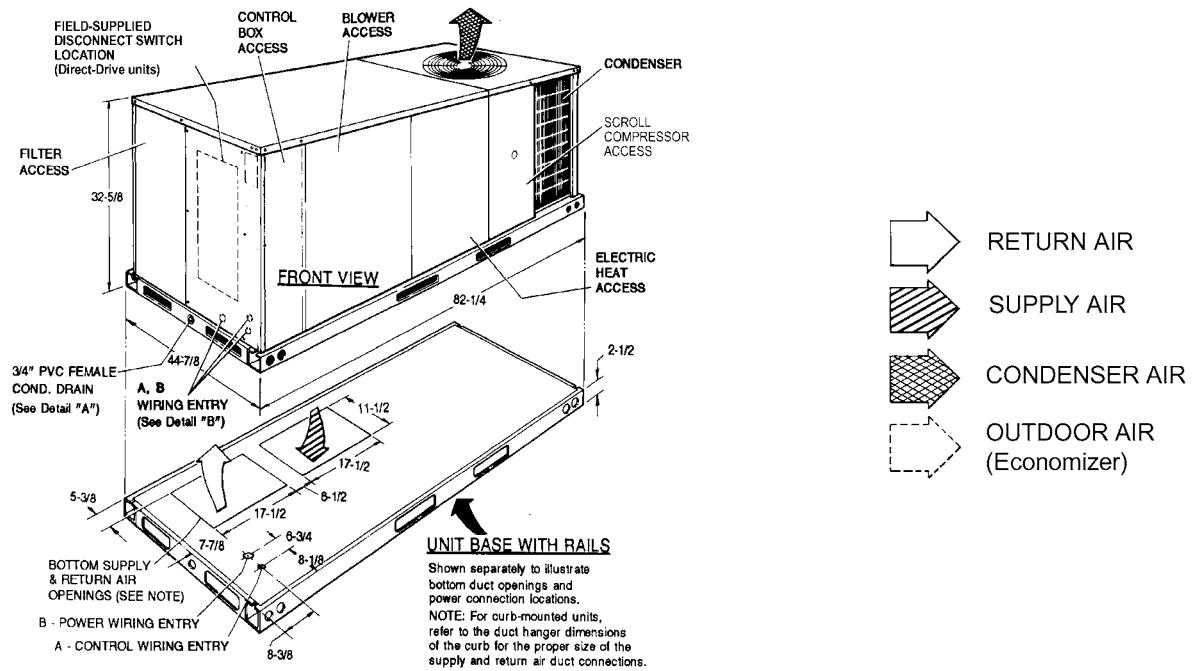
TABLE 39: ELECTRIC HEAT CORRECTION FACTORS

NOMINAL VOLTAGE	VOLTAGE	kW CAP. MULTIPLIER
208	208	1.00
240	230	0.92
480	460	0.92
600	575	0.92

TABLE 40: VOLTAGE LIMITATIONS¹

POWER SUPPLY	VOLTAGE	
	MIN.	MAX.
208/230-3-60	187	252
460-3-60	432	504
575-3-60	540	630

1. Utilization Range "A" in accordance with ARI Standard 110.

**FIGURE 10 - UNIT DIMENSIONS (3 - 6 TON COOLING ONLY/ELECTRIC HEAT) FRONT VIEW**

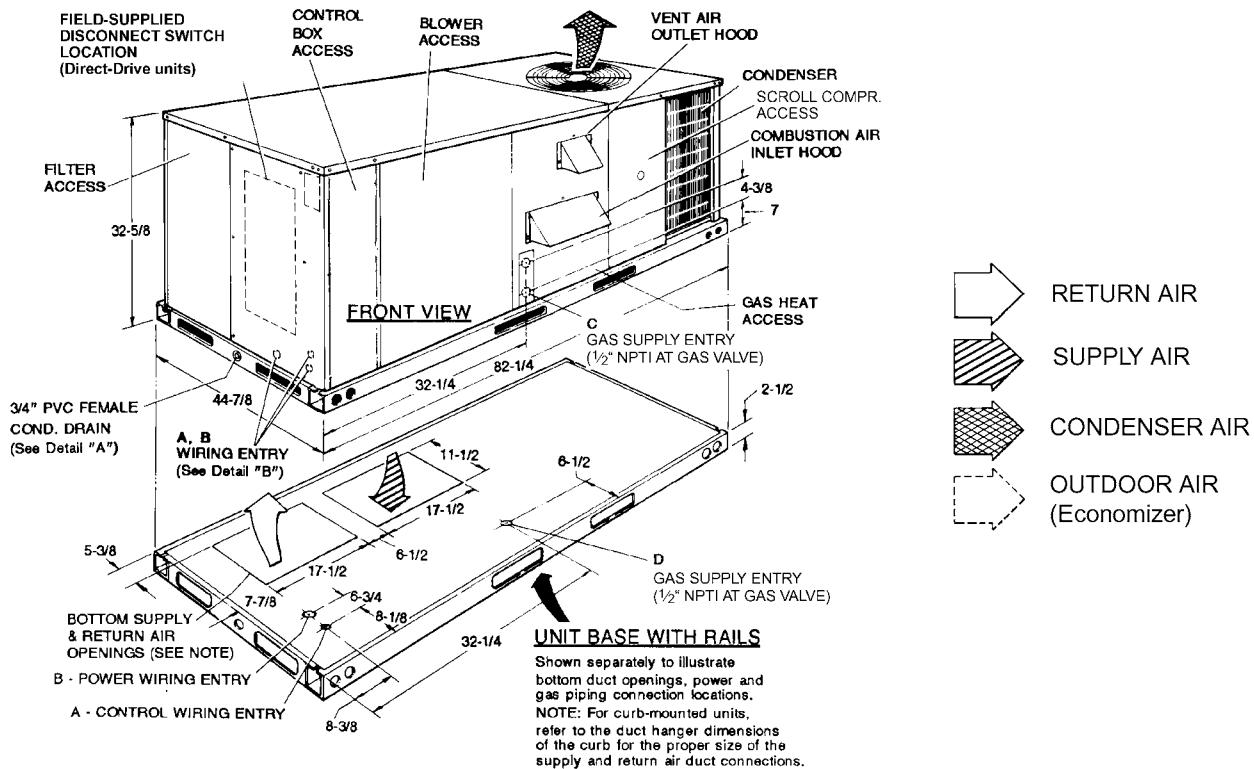


FIGURE 11 - UNIT DIMENSIONS (3 - 6 TON COOLING/GAS HEAT) FRONT VIEW

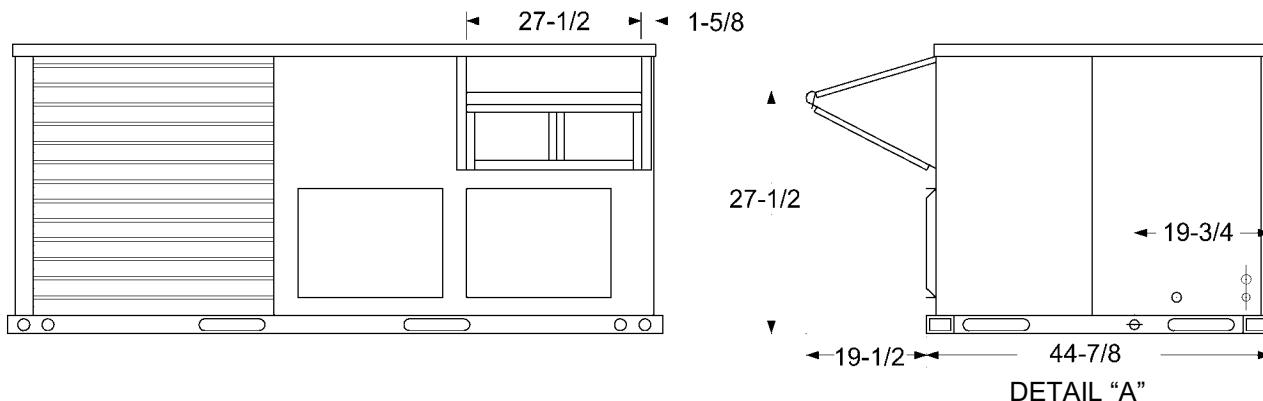


FIGURE 12 - UNIT WITH ECONOMIZER RAINHOOD

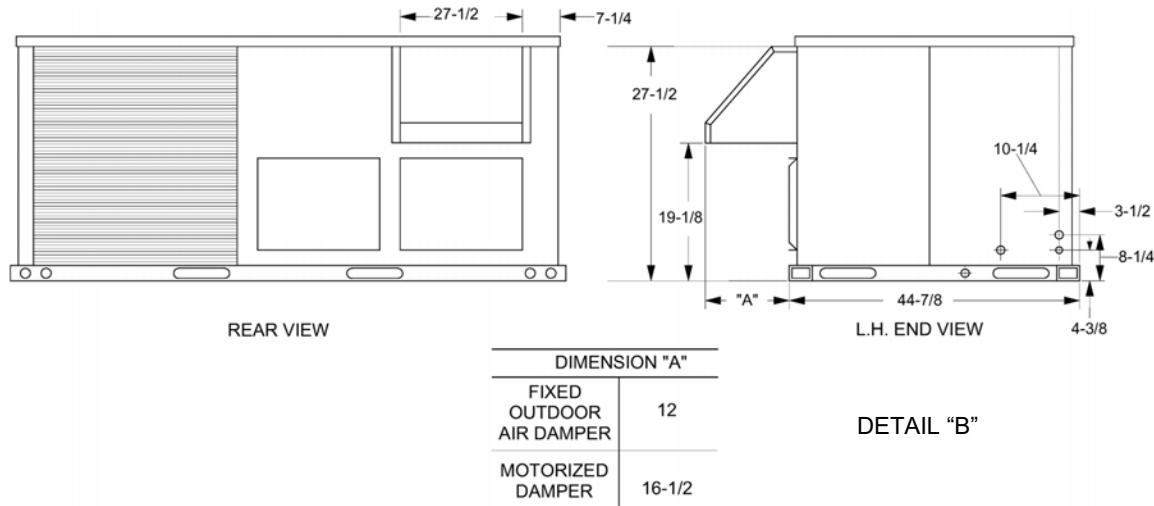
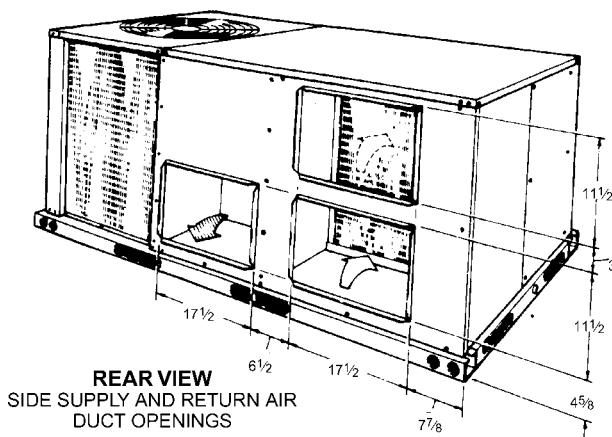
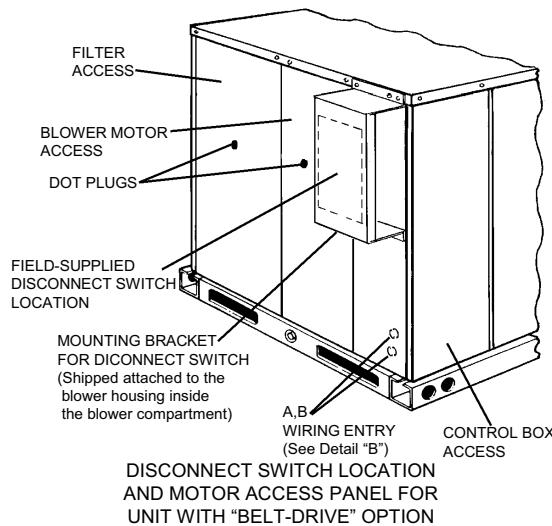


FIGURE 13 - UNIT WITH FIXED OUTDOOR AIR/MOTORIZED DAMPER RAINHOOD



DUCT COVERS - Units are shipped with all air duct openings covered.
 For side duct applications;
 1. Remove and discard the supply and return air duct covers.
 2. Connect ductwork to duct flanges on the rear of the unit.
 For bottom duct applications;
 1. Remove the side supply air duct cover to gain access to the bottom supply air knockout panel.
 2. Remove and discard the bottom knockout panel.
 3. Replace the side duct cover.
 4. With filter section access panel removed from the unit, remove and discard the bottom return air knockout panel.
 5. Replace the filter access panel.

FIGURE 14 - UNIT DIMENSIONS (REAR VIEW)

**FIGURE 15 - DISCONNECT/BLOWER ACCESS LOCATION****TABLE 41: UTILITIES ENTRY**

HOLE	OPENING SIZE (DIA.)	USED FOR	
A	7/8" KO ¹	Control Wiring ²	Side
			Bottom
B	2" KO ¹	Power Wiring	Side
			Bottom
C	1-5/8" KO	Gas Piping (Front)	
D	1-1/2" KO	Gas Piping (Bottom)	

1. Opening in the bottom to the unit can be located by the side in the insulation.
2. Do not remove the 2" knockout ring.

TABLE 42: MINIMUM CLEARANCES

LOCATION	CLEARANCE
Front	24" (Cooling/Electric Heat) 32" (Gas Heat)
Rear	12" (Less Economizer) 36" (With Economizer or Fixed Air/Motorized Damper)
Left Side (Filter Access)	24" (Less Economizer) 36" (With Economizer)
Right Side (Cond. Coil)	24"
Below Unit ¹	0"
Above Unit ²	72" (For Condenser Air Discharge)

1. Units may be installed on combustible floors made from wood or class A, B, or C roof covering material.
2. Units must be installed outdoors. Overhanging structures or shrubs should not obstruct condenser air discharge outlet.

TABLE 43: SUPPLY AIR BLOWER PERFORMANCE (3 TON BELT DRIVE) - SIDE DUCT APPLICATION

UNIT TONNAGE	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE-IWG ³													
		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
		RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
3^{1,2}	1700	835	705	880	745	923	795	969	860	1013	970	-	-	-	-
	1600	811	655	854	695	898	740	942	790	986	840	1029	900	-	-
	1500	782	610	827	650	871	685	917	730	960	775	1003	825	1046	905
	1400	-	-	798	595	844	640	889	680	932	720	975	765	1018	790
	1300	-	-	-	-	816	590	862	635	907	675	951	715	995	750
	1200	-	-	-	-	-	-	834	585	881	630	927	665	970	705
	1100	-	-	-	-	-	-	809	550	855	590	900	625	942	665
	1000	-	-	-	-	-	-	782	510	829	545	872	858	919	625
	900	-	-	-	-	-	-	-	-	797	500	843	540	890	580
3^{1,2}	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE-IWG ³													
		0.90		1.00		1.10		1.20		1.30		1.40		1.50	
		RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
	1700	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1600	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1500	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1400	1055	875	-	-	-	-	-	-	-	-	-	-	-	-
	1300	1036	780	1066	850	-	-	-	-	-	-	-	-	-	-
	1200	1011	735	1047	765	1075	800	-	-	-	-	-	-	-	-

1. 230/460/575 Volts

2. For 208 Volts multiply values by 0.95.

3. Includes allowances for a wet evaporator coil, 1" filters, and the heat exchangers. Refer to STATIC RESISTANCE Table for resistance values on applications other than gas / electric units with side duct airflows.

TABLE 44: SUPPLY AIR BLOWER PERFORMANCE (4 TON BELT DRIVE) - SIDE DUCT APPLICATION

UNIT TONNAGE	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE-IWG ³													
		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
		RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
4 ^{1,2}	2000	843	860	880	925	919	1005	956	1065	993	1145	1030	1195	1067	1235
	1900	817	775	854	850	893	920	930	995	970	1065	1008	1125	1046	1170
	1800	790	700	828	760	867	840	906	905	944	980	985	1040	1025	1100
	1700	-	-	802	670	840	745	881	815	920	900	961	970	1001	1030
	1600	-	-	-	-	818	665	858	740	898	820	940	890	980	950
	1500	-	-	-	-	-	-	842	695	882	755	922	835	962	895
	1400	-	-	-	-	-	-	833	650	867	705	904	765	942	820
	1300	-	-	-	-	-	-	-	-	858	665	893	725	932	785
	1200	-	-	-	-	-	-	-	-	847	640	880	680	916	730
UNIT TONNAGE	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE-IWG ³													
		0.90		1.00		1.10		1.20		1.30		1.40		1.50	
		RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
4 ^{1,2}	2000	1103	1270	-	-	-	-	-	-	-	-	-	-	-	-
	1900	1085	1210	-	-	-	-	-	-	-	-	-	-	-	-
	1800	1064	1145	1102	1180	-	-	-	-	-	-	-	-	-	-
	1700	1040	1075	1081	1115	1121	1140	-	-	-	-	-	-	-	-
	1600	1020	1005	1060	1050	1100	1085	-	-	-	-	-	-	-	-
	1500	1003	945	1044	995	1086	1035	-	-	-	-	-	-	-	-
	1400	982	880	1024	920	1067	965	1107	1000	-	-	-	-	-	-
	1300	970	835	1010	870	1053	920	1099	960	-	-	-	-	-	-
	1200	953	780	992	815	1034	855	1080	905	-	-	-	-	-	-

1. 230/460/575 Volts

2. For 208 Volts multiply values by 0.95.

3. Includes allowances for a wet evaporator coil, 1" filters, and the heat exchangers. Refer to STATIC RESISTANCE Table for resistance values on applications other than gas / electric units with side duct airflows.

TABLE 45: SUPPLY AIR BLOWER PERFORMANCE (5 TON BELT DRIVE) - SIDE DUCT APPLICATION

UNIT TONNAGE	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE-IWG ³													
		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
		RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
5 ^{1, 2}	2500	1059	1560	1077	1590	1095	1630	1114	1650	1134	1660	1158	1685	1181	1720
	2400	1032	1405	1054	1470	1074	1525	1094	1560	1116	1595	1140	1620	1167	1640
	2300	1005	1260	1024	1275	1049	1370	1069	1440	1090	1475	1116	1505	1142	1535
	2200	980	1160	1002	1170	1022	1190	1044	1250	1066	1350	1090	1410	1117	1440
	2100	930	1060	957	1070	983	1080	1010	1100	1039	1160	1064	1260	1092	1340
	2000	877	950	908	975	941	1000	976	1020	1009	1050	1040	1100	1070	1225
	1900	-	-	-	-	894	885	940	940	980	980	1014	1020	1047	1095
	1800	-	-	-	-	855	815	903	860	950	905	988	940	1022	970
	1700	-	-	-	-	-	-	884	815	925	850	964	880	1001	910
	1600	-	-	-	-	-	-	864	770	908	805	948	835	987	870
	1500	-	-	-	-	-	-	-	-	882	740	926	780	965	830

UNIT TONNAGE	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE-IWG ³													
		0.90		1.00		1.10		1.20		1.30		1.40		1.50	
		RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
5 ^{1, 2}	2500	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2400	1193	1665	-	-	-	-	-	-	-	-	-	-	-	-
	2300	1170	1580	1202	1620	-	-	-	-	-	-	-	-	-	-
	2200	1148	1480	1180	1530	-	-	-	-	-	-	-	-	-	-
	2100	1121	1385	1155	1425	1190	1475	-	-	-	-	-	-	-	-
	2000	1100	1285	1133	1340	1169	1385	1205	1445	-	-	-	-	-	-
	1900	1079	1180	1110	1240	1143	1280	1178	1330	1222	1375	-	-	-	-
	1800	1058	1060	1090	1135	1122	1190	1158	1240	1196	1295	-	-	-	-
	1700	1035	960	1071	1030	1103	1100	1134	1140	1164	1175	1197	1205	-	-
	1600	1020	900	1056	965	1088	1035	1118	1065	1145	1105	1170	1130	1198	1150
	1500	1004	860	1038	880	1070	925	1101	980	1130	1045	1158	1075	1184	1110

1. 230/460/575 Volts

2. For 208 Volts multiply values by 0.95.

3. Includes allowances for a wet evaporator coil, 1" filters, and the heat exchangers. Refer to STATIC RESISTANCE Table for resistance values on applications other than gas / electric units with side duct airflows.

TABLE 46: SUPPLY AIR BLOWER PERFORMANCE (6 TON BELT DRIVE) - SIDE DUCT APPLICATION

UNIT TONNAGE	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE-IWG ³													
		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
		RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
6 ^{1,2}	3200	1150	2325	1182	2425	1212	2525	-	-	-	-	-	-	-	-
	3000	1100	2010	1129	2090	1157	2150	1185	2225	1215	2290	1242	2360	-	-
	2800	1045	1700	1074	1780	1102	1850	1131	1940	1160	2025	1190	2075	1217	2130
	2600	985	1425	1015	1475	1045	1540	1075	1630	1103	1715	1135	1760	1163	1825
	2400	930	1240	958	1300	990	1350	1020	1400	1051	1430	1081	1490	1111	1600
	2200	-	-	905	1070	933	1160	965	1210	997	1250	1028	1285	1060	1325
	2000	-	-	-	-	-	-	919	1025	950	1100	982	1130	1014	1160
	1800	-	-	-	-	-	-	-	-	909	925	939	1005	968	1030
UNIT TONNAGE	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE-IWG ³													
		0.90		1.00		1.10		1.20		1.30		1.40		1.50	
		RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
6 ^{1,2}	3200	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2800	1245	2190	-	-	-	-	-	-	-	-	-	-	-	-
	2600	1193	1920	1222	1990	1250	2060	-	-	-	-	-	-	-	-
	2400	1142	1675	1173	1730	1205	1800	1234	1885	-	-	-	-	-	-
	2200	1090	1380	1124	1450	1155	1550	1186	1640	1217	1710	1249	1775	-	-
	2000	1045	1175	1077	1200	1109	1275	1140	1360	1170	1460	1205	1545	1235	1600
	1800	998	1050	1028	1060	1058	1060	1087	1075	1118	1150	1148	1250	1176	1360

1. 230/460/575 Volts

2. For 208 Volts multiply values by 0.95.

3. Includes allowances for a wet evaporator coil, 1" filters, and the heat exchangers. Refer to STATIC RESISTANCE Table for resistance values on applications other than gas / electric units with side duct airflows.

TABLE 47: SUPPLY AIR BLOWER PERFORMANCE (3 - 6 TON DIRECT DRIVE) - SIDE DUCT APPLICATION

UNIT TONNAGE	MOTOR SPEED	AVAILABLE EXTERNAL STATIC PRESSURE-IWG ²									
		0.20		0.30		0.40		0.50		0.60	
		CFM	WATTS	CFM	WATTS	CFM	WATTS	CFM	WATTS	CFM	WATTS
3 ¹	HI	-	-	-	-	1699	825	1650	785	1570	755
	MED	1684	800	1631	780	1582	750	1524	720	1410	690
	LOW	1487	710	1464	690	1421	670	1367	650	1315	620
4 ¹	HI	1996	960	1933	936	1868	910	1795	880	1722	845
	MED	1804	838	1765	810	1714	785	1650	765	1589	735
	LOW	1681	760	1640	738	1604	715	1541	695	1490	670
5 ¹	HI	2400	1155	2338	1125	2274	1095	2167	1045	2096	1010
	MED	2290	1105	2214	1065	2145	1030	2071	990	1990	950
	LOW	2150	1020	2100	990	2029	950	1965	910	1905	880
6 ¹	HI	2461	1480	2402	1440	2361	1395	2260	1350	2178	1305
UNIT TONNAGE)	MOTOR SPEED	AVAILABLE EXTERNAL STATIC PRESSURE-IWG ²									
		0.70		0.80		0.90		1.00			
		CFM	WATTS	CFM	WATTS	CFM	WATTS	CFM	WATTS		
3 ¹	HI	1430	725	1360	700	1280	680	1180	655		
	MED	1324	650	1260	630	1185	610	1100	590		
	LOW	1246	605	1185	590	1110	570	1020	545		
4 ¹	HI	1635	820	1544	790	1419	765	1300	740		
	MED	1508	705	1407	675	1306	645	1195	625		
	LOW	1416	645	1337	620	1230	595	1120	575		
5 ¹	HI	1990	980	1887	945	1771	905	1629	855		
	MED	1911	920	1828	885	1724	835	1604	798		
	LOW	1816	838	1724	800	1644	770	1531	710		
6 ¹	HI	2101	1260	2000	1205	1914	1155	1830	1110		

1. Side Duct application (230/460/575 Volts)

2. Includes allowances for a wet evaporator coil, 1" filters, and the heat exchangers. Refer to STATIC RESISTANCES Table for resistance values.

TABLE 48: BELT DRIVE BLOWER MOTOR AND DRIVE DATA

MODEL SIZE	BLOWER RANGE (RPM)	MOTOR ¹		ADJUSTABLE MOTOR PULLEY				FIXED BLOWER PULLEY				BELT (NOTCHED)		
		HP	FRAME	DESIG- NATION	OUTSIDE DIA. (IN.)	PITCH DIA. (IN.)	BORE (IN.)	DESIG- NATION	OUTSIDE DIA. (IN.)	PITCH DIA. (IN.)	BORE (IN.)	DESIG- NATION	PITCH LENGTH (IN.)	QTY.
3 TON	790/1120	1 1/2	56	1VL40	2.7-3.7	2.4-3.4	5/8	AK61	5.9	5.7	1	A36	37.3	1
4 TON	790/1120	1 1/2	56	1VL40	2.7-3.7	2.4-3.4	5/8	AK61	5.9	5.7	1	A36	37.3	1
5 TON	850/1220	1 1/2	56	1VL40	2.7-3.7	2.4-3.4	5/8	AK56	5.4	5.2	1	A36	37.3	1
6 TON	900/1250	1 1/2	56	1VL44	3.1-4.1	2.8-3.8	7/8	AK56	5.4	5.2	1	A36	37.3	1

1. All motors have solid bases and are inherently protected. These motors can be selected to operate into their service factor because they are located in the moving air, upstream of any heating device.

TABLE 49: STATIC RESISTANCES

DESCRIPTION	RESISTANCE, IWG										
	CFM										
	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
ECONOMIZER ^{1,3}	0.07	0.08	0.09	0.11	0.13	0.15	0.17	0.20	0.23	0.26	0.30
ELECTRIC HEATERS ¹	7-15KW	0.04	0.05	0.06	0.07	0.08	0.10	0.12	0.14	0.16	0.19
	20-30KW	0.06	0.07	0.08	0.09	0.11	0.13	0.15	0.17	0.20	0.23
BOTTOM DUCT CONNECTIONS ¹	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.14	0.16	0.19	0.22
COOLING ONLY ²	0.08	0.10	0.12	0.14	0.16	0.18	0.20	0.23	0.26	0.29	0.32

1. Deduct these resistance values from the available external static pressure shown in SUPPLY AIR BLOWER PERFORMANCE Tables.
2. Add these resistance values to the available static resistance values on SUPPLY AIR BLOWER PERFORMANCE Tables.
3. The pressure through the economizer is greater for 100% outdoor air than for 100% return air. If the resistance of the return air duct system is less than 0.25 IWG, the unit will deliver less CFM during full economizer operation.

PHASING

Check for proper compressor rotation. If the blower or compressors rotate in the wrong direction at start-up, the electrical connection to the unit is misphased. Change the incoming line connection phasing to obtain proper rotation. (Scroll compressors operate in only one direction. If the scroll is drawing low amperage, has similar suction and discharge pressures, or producing a high noise level, the scroll is misphased).

CAUTION

Scroll compressors require proper rotation to operate correctly. Do not change the internal wiring to make the blower, condenser fans, or compressor rotate correctly. Change the incoming power to the main terminal block to obtain proper rotation.

SUPPLY AIR BLOWERS

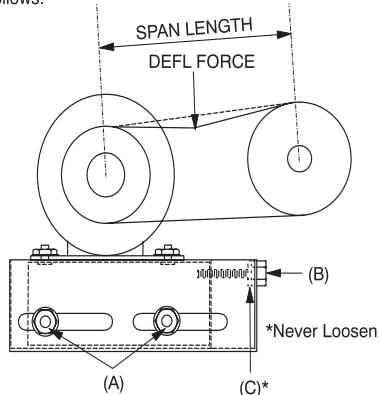
These blowers have either 3-speed direct drive motors, or single speed motors equipped with a belt drive. Belt drive units have a variable pitch pulley that allows the blower speed to be adjusted.

CHECKING SUPPLY AIR CFM

The RPM of the supply air blower will depend on the required CFM, the unit accessories or options and the static resistances of both the supply and the return air duct systems. With this information, the motor speed tap (direct drive) or the motor pulley number of turns open (belt drive) can be determined from the Blower Performance Data Tables.

PROCEDURE FOR ADJUSTING BELT TENSION:

1. Loosen nuts (A) (top and bottom).
2. Adjust the tension by turning bolt (B).
3. Never loosen nuts (C) from each other.
4. Use a belt tension checker to apply a perpendicular force to be one belt at the midpoint of the span as shown. The deflection force should be applied until a specific deflection distance of 4mm (5/32") is obtained. To determine the deflection distance from normal position, use a straight edge from sheave to sheave as a reference line. The recommended deflection force is as follows:



Tension new belts at the max. deflection force recommended for the belt section. Check the belt tension at least two times during the first 24 hours of operation. Any re-tensioning should fall between the min. and max. deflection force values.

5. After adjusting, re-tighten nuts (A).

FIGURE 16 - BELT ADJUSTMENT

Note the following:

1. The supply air CFM must be within the limitations shown in the Unit Application Data Table 1.
2. Pulleys can be adjusted in half turn increments.
3. The tension on the belt should be adjusted as shown in the Belt Adjustment Figure 16.

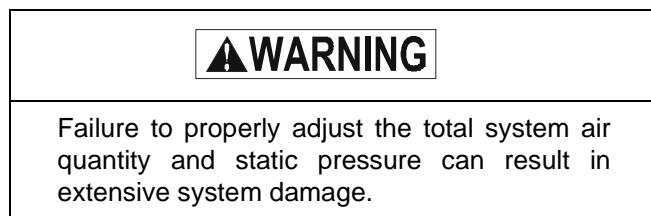
Start the supply air blower motor. Adjust the resistances in both the supply and the return air duct systems to balance the air distribution throughout the conditioned space. The job specifications may require that this balancing be done by someone other than the equipment installer.

To check the supply air CFM after the initial balancing has been completed:

1. Remove the two 5/16" dot plugs from the blower motor and the filter access panels shown in Figure 15.
2. Insert at least 8" of 1/4 inch tubing into each of these holes for sufficient penetration into the air flow on both sides of the indoor coil.

NOTE: The tubes must be inserted and held in a position perpendicular to the air flow so that velocity pressure will not affect the static pressure readings.

3. Using an inclined manometer, determine the pressure drop across a dry evaporator coil. Since the moisture on an evaporator coil may vary greatly, measuring the pressure drop across a wet coil under field conditions would be inaccurate. To assure a dry coil, the compressors should be deactivated while the test is being run.
4. Knowing the pressure drop across a dry coil, the actual CFM through the unit can be determined from the curve in Pressure Drop vs. Supply Air CFM (Figure 17).



After readings have been obtained, remove the tubes and reinstall the two 5/16" dot plugs that were removed in Step 1.

NOTE: De-energize the compressors before taking any test measurements to assure a dry indoor coil.

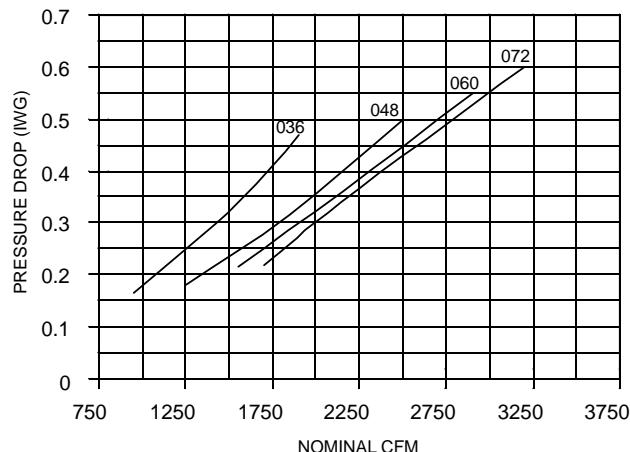


FIGURE 17 - PRESSURE DROP ACROSS COIL

OPERATION

SEQUENCE OF OPERATIONS OVERVIEW

For these units, the thermostat makes a circuit between "R" and "Y1" for the cooling cycle.

The call is passed to the unit control board (UCB), which then determines whether the requested operation is available and, if so, which components to energize.

For gas heating, the UCB monitors the "W1" call but does not handle the operation of the gas furnace. An ignition control board controls the gas heater operation.

For electric heat units, the UCB passes the call to the electric heater.

In both cases, when the "W1" call is sensed, the indoor air blower is energized following a specified heating delay.

If at any time a call for both heating and cooling are present, the heating operation will be performed. If operating, the cooling system is halted as with a completion of a call for cooling. Heating always takes priority.

COOLING SEQUENCE OF OPERATION

CONTINUOUS BLOWER

By setting the room thermostat fan switch to "ON," the supply air blower will operate continuously.

INTERMITTENT BLOWER

With the room thermostat fan switch set to "AUTO" and the system switch set to either the "AUTO" or "HEAT" settings, the blower is energized whenever a cooling or heating operation is requested. The blower is energized after any specified delay associated with the operation.

When energized, the indoor blower has a minimum run time of 30 seconds. Additionally, the indoor blower has a delay of 10 seconds between operations.

NO OUTDOOR AIR OPTIONS

When the thermostat calls for cooling, the low-voltage control circuit from "R" to "Y1" and "G" is completed. The compressor and condenser fan motor are energized. After completing the specified fan on delay for cooling, the UCB will energize the blower motor.

Once the thermostat has been satisfied, it will de-energize Y1. If the compressor has satisfied its minimum run time, the compressor and condenser fan de-energize. Otherwise, the unit operates the cooling system until the minimum run time for the compressor has been completed. After the compressor de-energizes, the blower is stopped following the elapse of the fan off delay for cooling.

To be available, a compressor must not be locked-out due to a high or low-pressure switch or freezestat trip and the anti-short cycle delay (ASCD) must have elapsed.

ECONOMIZER WITH SINGLE ENTHALPY SENSOR

When the room thermostat calls for cooling, the low voltage control circuit from "R" to "G" and "Y1" is completed. The UCB energizes the blower motor (if the fan switch on the room thermostat is set in the "AUTO" position) and drives the economizer dampers from fully closed to their minimum position. If the enthalpy of the outdoor air is below the setpoint of the enthalpy controller (previously determined), "Y1" energizes the economizer. The dampers will modulate to maintain a

constant supply air temperature as monitored by the discharge air sensor. If the outdoor air enthalpy is above the setpoint, "Y1" energizes the compressor and condenser fan motor only.

Once the thermostat has been satisfied, it will de-energize "Y1". If the compressor has satisfied its minimum run time, the compressor and condenser fan are de-energized. Otherwise, the unit operates the cooling system until the minimum run times for the compressor has been completed. After the compressor de-energizes, the blower is stopped following the elapse of the fan off delay for cooling, and the economizer damper goes to the closed position. If the unit is in continues fan operation the economizer damper goes to the min. position.

ECONOMIZER WITH DUAL ENTHALPY SENSORS

The operation with the dual enthalpy sensors is identical to the single sensor except that a second enthalpy sensor is mounted in the return air. This return air sensor allows the economizer to choose between outdoor air and return air, whichever has the lowest enthalpy value, to provide maximum operating efficiency.

ECONOMIZER (SINGLE OR DUAL) WITH POWER EXHAUST

This system operates as specified above with one addition. The power exhaust motor is energized 45 seconds after the actuator position exceeds the exhaust fan setpoint on the economizer control. When the power exhaust is operating, the second stage of mechanical cooling will not operate. As always, the "R" to "G" connection provides minimum position but does not provide power exhaust operation.

MOTORIZED OUTDOOR AIR DAMPERS

This system operation is the same as the units with no outdoor air options with one exception. When the "R" to "G" circuit is complete, the motorized damper drives open to a position set by the thumbnail on the damper motor. When the "R" to "G" circuit is opened, the damper spring returns fully closed.

COOLING OPERATION ERRORS

Each cooling system is monitored for operation outside of the intended parameters. Errors are handled as described below. All system errors override minimum run times for compressors.

HIGH-PRESSURE LIMIT SWITCH

During cooling operation, if a high-pressure limit switch opens, the UCB will de-energize the compressor, initiate the ASCD (Anti-short cycle delay), and, stop the condenser fan. If the call for cooling is still present at the conclusion of the ASCD, the UCB will re-energize the compressor.

Should a high-pressure switch open three times within two hours of operation, the UCB will lock-out the compressor and flash a code (see Table 55).

LOW-PRESSURE LIMIT SWITCH

The low-pressure limit switch is not monitored during the initial 30 seconds of a cooling system's operation. For the following 30 seconds, the UCB will monitor the low-pressure switch to ensure it closes. If the low-pressure switch fails to close after the 30-second monitoring phase, the UCB will de-energize the compressor, initiate the ASCD, and stop the condenser fan.

Once the low-pressure switch has been proven (closed during the 30-second monitor period described above), the UCB will monitor the low-pressure limit switch for any openings. If the low-pressure switch opens for greater than 5 seconds, the UCB will de-energize the compressor, initiate the ASCD, and stop the condenser fan.

If the call for cooling is still present at the conclusion of the ASCD, the UCB will re-energize the compressor.

Should a low-pressure switch open three times within one hour of operation, the UCB will lock-out the compressor and flash a code (Table 55).

FREEZESTAT

During cooling operation, if a freezestat opens, the UCB will de-energize the compressor, initiate the ASCD, and stop the condenser fan. If the call for cooling is still present at the conclusion of the ASCD, the UCB will re-energize the compressor.

Should a freezestat open three times within two hours of operation, the UCB will lock-out the compressor and flash a code (Table 55).

LOW AMBIENT COOLING

To determine when to operate in low ambient mode, the UCB has a pair of terminals connected to a temper-

ature-activated switch set at 45°F. When the low ambient switch is closed and the thermostat is calling for cooling, the UCB will operate in the low ambient mode.

Low ambient mode operates the compressors in this manner: 10 minutes on, 5 minutes off. The indoor blower is operated throughout the cycle. The 5-minute off period is necessary to defrost the indoor coil.

Low ambient mode always begins with compressor operation. Compressor minimum run time may extend the minutes of compressor operation. The defrost cycle will begin immediately following the elapse of the minimum run time.

When operating in low ambient mode, the UCB will not lockout the compressor due to a freezestat trip. However, a freezestat trip will de-energize the compressor. If the call for cooling is still present at the end of the ASCD and the freezestat has closed, the unit will resume operation.

SAFETY CONTROLS

The unit control board monitors the following inputs for the cooling system:

1. A suction line freezestat to protect against low evaporator temperatures due to a low airflow or a low return air temperature, (opens at 26 ± 5 °F and resets at 38 ± 5 °F).
2. A high-pressure switch to protect against excessive discharge pressures due to a blocked condenser coil or a condenser motor failure, (opens at 380 ± 10 psig and resets at 300 ± 10 psig).
3. A low-pressure switch to protect against loss of refrigerant charge, (opens at 7 ± 3 psig and resets at 22 ± 5 psig).

The above pressure switches are hard-soldered to the unit. The refrigeration system is monitored and controlled. On any fault, the system will be affected by any safety/preventive action.

The unit control board monitors the temperature limit switch of electric heat units and the temperature limit switch and the gas valve of gas furnace units.

COMPRESSOR PROTECTION

The compressor also has inherent (internal) protection. If there is an abnormal temperature rise in a compres-

sor, the protector will open to shut down the compressor. The UCB incorporates features to minimize compressor wear and damage. An anti-short cycle delay (ASCD) is utilized to prevent operation of a compressor too soon after its previous run. Additionally, a minimum run time is imposed any time a compressor is energized.

The ASCD is initiated on unit start-up and on any compressor reset or lock-out.

FLASH CODES

The UCB will initiate a flash code associated with errors within the system. Refer to UNIT CONTROL BOARD FLASH CODES Table 55.

RESET

Remove the call for cooling, by raising thermostat setting higher than the conditioned space temperature. This resets any pressure or freezestat flash codes.

ELECTRIC HEATING SEQUENCE OF OPERATIONS

The following sequence describes the operation of the electric heat section.

Single-stage heating (applies only to 5, 7 & 10 kW 230V heaters and to 7, 10, & 15 kW 460V and 575V heaters. All other heaters MUST use a two-stage thermostat):

- Upon a call for heat by the thermostat, the heater sequencer (1S) will be energized. After completing the specified fan on delay for heating, the UCB will energize the blower motor.
- The thermostat will cycle the electric heat to satisfy the heating requirements of the conditioned space.

Two-stage heating (applies only to 15, 20 and 30 kW 230V heaters and 20 and 30 kW heater 460V and 575V heaters.):

- Upon a call for first-stage heat by the thermostat, the heater sequencer (1S) (15, 20, 30 kW 230 volt) and contactor (2M) (20, 30 kW 460 and 575 volt) will be energized. After completing the specified fan on delay for heating, the UCB will energize the blower motor.

If the second stage of heat is required, heater sequencer (2S) (12, 20, 30 kW 230 volt) or contactor (3M) (20, 30 kW 460 and 575 volt) will be energized.

After completing the specified fan on delay for heating, the UCB will energize the blower motor.

- The thermostat will cycle the electric heat to satisfy the heating requirements of the conditioned space.

SAFETY CONTROLS

The control circuit includes the following safety controls:

- Temperature Limit Switch (TLS) - This control is located inside the heater compartment and is set to open at the temperature indicated in the Electric Heat Limit Control Setting Table 50. It resets automatically. The limit switch operates when a high temperature condition, caused by inadequate supply air flow occurs, thus shutting down the heater and energizing the blower.

TABLE 50: ELECTRIC HEAT LIMIT CONTROL SETTING

VOLTAGE	KW	TEMPERATURE LIMIT SWITCH	Open Temp °F
230-1-60	5	1	140
	7	1,3	140
	10	1,2,3	140
	15	2,4,6	140
	20	1,2,3,4,5	140
	30	6	150
		1,2,3,4,5,6	150
230-3-60	5	1,2,3	140
	7	1,2,3	140
	10	1,2,3	150
	15	2,4,6	140
	20	1,2,3,4,5,6	150
	30	1,3,5	160
		2,4,6	150
460-3-60	7	2,4,6	140
	10	2,4,6	140
	15	2,4,6	140
	20	3	160
	30	3	150
575-3-60	10	2,4,6	140
	15	2,4,6	140
	20	5	160
	30	5	150

RESET

Remove the call for heating by lowering the thermostat setting lower than the conditioned space temperature. This resets any flash codes.

HEAT ANTICIPATOR SETPOINTS

It is important that the anticipator setpoint be correct. Too high of a setting will result in longer heat cycles and a greater temperature swing in the conditioned space. Reducing the value below the correct setpoint will give shorter "ON" cycles and may result in the lowering of the temperature within the conditioned space. Refer to Table 51 for the required heat anticipator setting.

TABLE 51: ELECTRIC HEAT ANTICIPATOR SETPOINTS

HEATER KW	VOLTAGE	SETTING, AMPS	
		TH1	TH2
5	230-3-60	0.35	-
7		0.35	-
10		0.35	-
15		0.35	0.19
20		0.35	0.38
30		0.35	0.38
7	460-3-60	0.35	-
10		0.35	-
15		0.35	-
20		0.37	0.29
30		0.37	0.29
10	575-3-60	0.35	-
15		0.35	-
20		0.37	0.29
30		0.37	0.29

GAS HEATING SEQUENCE OF OPERATIONS

When the thermostat calls for heating, the low-voltage control circuit from "R" to "W1" and "G" is completed, through the UCB. The heat relay "RW1" is energized. The "RW1-2" contacts close energizing the draft motor control (DMC). The draft motor control contacts close and start the draft motor. As the speed of the draft motor reaches approximately 2500 RPM, the centrifugal switch contact, located on the end of the draft motor

shaft, closes to power the ignition module (IC), through the "RW1-1" contacts.

Ignition module "IC" will immediately start the igniter sparking and will open the redundant valve located inside the main gas valve "GV" to allow a flow of gas to the carryover tube. Only after the pilot flame has been ignited and the presence of pilot flame detected at the "IC" by a signal sent back through the flame sensor is sparking terminated and the main gas valve opened.

Gas flows into each of the main burners and is ignited from the carryover tube flame.

After completing the specified fan on delay for heating, the UCB will energize the blower motor.

If "IC" fails to detect a pilot flame, it will continue to try for a maximum of 85 seconds to ignite the pilot tube. If the pilot flame is not detected, then "IC" will lock out furnace operation for five minutes or until 24V power is removed from the module either at the unit or by resetting the room thermostat.

When the thermostat satisfies de-energizing the "RW1", thus opening the gas valve. The blower motor will continue to run after the furnace is shut down until the specified fan off delay for heating has been satisfied. The UCB will de-energize the blower motor.

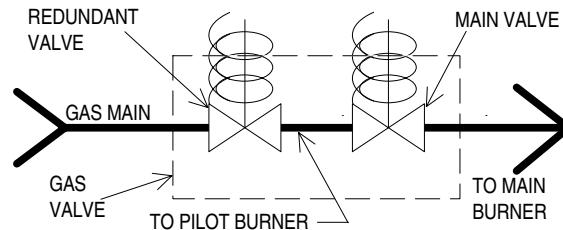


FIGURE 18 - GAS VALVE PIPING

When the thermostat calls for the first stage of heating, the low-voltage control circuit from "R" to "W1" is completed. A call for heat passes through the UCB to the ignition control board (ICB). The UCB monitors the "W1" call and acts upon any call for heat. Once voltage has been sensed at "W1", the UCB will initiate the fan on delay for heating, energizing the indoor blower after the specified delay has elapsed.

When the thermostat has been satisfied, heating calls are ceased. The GV is immediately de-energized. The

blower is de-energized after the fan off delay for heating has elapsed. The draft motor performs a 25-second post purge.

GAS HEATING OPERATION ERRORS

TEMPERATURE LIMIT

If the UCB senses zero volts from the high temperature limit, the indoor blower motor is immediately energized. When the UCB again senses 24 volts from the temperature limit, the draft motor will perform a 25-second post-purge and the indoor blower will be de-energized following the elapse of the fan off delay for heating.

The temperature limit is monitored at all times.

If the temperature limit opens three times within one hour, it will lock-on the indoor blower motor and a flash code is initiated (See Table 55).

GAS VALVE

The UCB continuously monitors the GV. Any time the UCB senses voltage at the GV without a call for heat for a continuous five-minute period, the UCB will lock-on the indoor blower and a flash code is initiated (Table 55). When voltage is no longer sensed at the GV, the UCB will de-energize the indoor blower following the elapse of the fan off delay for heating.

If voltage has been sensed at the GV for at least 15 seconds during the fan on delay for heating and GV voltage or "W1" is lost, the indoor blower is forced on for the length of the fan off delay for heating.

SAFETY CONTROLS

The unit control board monitors the temperature limit switch and the gas valve of gas furnace units.

The control circuit includes the following safety controls:

1. Limit Control (LS) - This control is located inside the heat exchanger compartment and is set to open at the temperature indicated in the Gas Heat Limit Control Setting Table 52. It resets automatically. The limit switch operates when a high temperature condition, caused by inadequate supply air flow occurs, thus shutting down the ignition control and closing the main gas valve and energizing the blower.

2. Centrifugal Switch (CS) - If the draft motor should fail, the centrifugal switch attached to the shaft of the motor prevents the ignition control and gas valve from being energized.
3. Redundant Gas Valve - This valve is an integral part of the main gas valve and is located up stream of the main gas valve. Should the main gas valve fail in the open position, the redundant valve serves as a back-up and shuts off the flow of gas.
4. Flame Sensor Rod / 100% Ignition Control Lock-Out - The flame rods and controls are located per Proper Flame Adjustment Figure 20. If an ignition control fails to detect a signal from the flame sensor indicating the pilot flame is properly ignited, then the main gas valve will not open. It will continue to try and ignite the pilot for a maximum of 85 seconds, then if the pilot flame is not detected, the ignition control will lock out furnace operation until 24V power is removed from the module either at the unit or by resetting the room thermostat.
5. Rollout Switch (RS) - This switch is located in the burner vestibule. In the event of a sustained main burner flame rollout, it shuts off the ignition control and closes the main gas valve.

NOTE: The auto reset rollout switch must reset before allowing furnace operation.

6. Auxiliary limit switch (AUX) - This control is located inside the heat exchanger compartment and is set to open at 190°F. It is a manual reset switch. If AUX trips, then the primary limit has not functioned correctly. Replace the primary limit.

TABLE 52: GAS HEAT LIMIT CONTROL SETTING

Units (Tons)	Capacity, MBH		Limit Control Opens, °F
	Input	Output	
3	50	40	165
4	75	60	165
3	100	79	165
4	125	99	165
5	100	79	165
5	125	99	165
6	100	79	165
6	125	99	165

FLASH CODES

The UCB will initiate a flash code associated with errors within the system. Refer to UNIT CONTROL BOARD FLASH CODES Table 55.

RESETS

Remove the call for heating by lowering the thermostat setting lower than the conditioned space temperature. This resets any flash codes.

HEAT ANTICIPATOR SETPOINTS

It is important that the anticipator setpoint be correct. Too high of a setting will result in longer heat cycles and a greater temperature swing in the conditioned space. Reducing the value below the correct setpoint will give shorter "ON" cycles and may result in the lowering of the temperature within the conditioned space.

TABLE 53: GAS HEAT ANTICIPATOR SETPOINTS

Gas Valve	Anticipator Setpoint
Honeywell VR8204M	0.60 amp
White-Rodgers 36E36	0.54 amp

START-UP (COOLING)

PRESTART CHECK LIST

After installation has been completed:

1. Check the electrical supply voltage being supplied. Be sure that it is the same as listed on the unit nameplate.
2. Set the room thermostat to the off position.
3. Turn unit electrical power on.
4. Set the room thermostat fan switch to on.
5. Check indoor blower rotation.
 - If blower rotation is in the wrong direction. Refer to Phasing Section in general information section.
 - Check blower drive belt tension.

6. Check the unit supply air (CFM). See "CHECKING SUPPLY AIR CFM" on page 60.
7. Measure evaporator fan motor's amp draw.
8. Set the room thermostat fan switch to off.
9. Turn unit electrical power off.

OPERATING INSTRUCTIONS

1. Turn unit electrical power on.
2. Set the room thermostat setting to lower than the room temperature.
3. First stage compressors will energize after the built-in time delay (five minutes).
4. The second stage of the thermostat will energize second stage compressor if needed.

POST START CHECK LIST

1. Verify proper system pressures for both circuits.
2. Measure the temperature drop across the evaporator coil.
3. Measure the system Amperage draw across all legs of 3 phase power wires.
4. Measure the condenser fan amp draw.

SHUT DOWN

1. Set the thermostat to highest temperature setting.
2. Turn off the electrical power to the unit.

START-UP (GAS HEAT)

PRE-START CHECK LIST

Complete the following checks before starting the unit.

1. Check the type of gas being supplied. Be sure that it is the same as listed on the unit nameplate.
2. Make sure that the vent and combustion air hoods have been properly installed.

OPERATING INSTRUCTIONS

CAUTION

This furnace is equipped with an intermittent pilot and automatic re-ignition system. DO NOT attempt to manually light the pilot.

TO LIGHT PILOT AND MAIN BURNERS:

1. Turn "off" electric power to unit.
2. Turn room thermostat to lowest setting.
3. Turn gas valve knob to "on" position.
4. Turn "on" electric power to unit.
5. Set room thermostat to desired temperature.
(If thermostat "set" temperature is above room temperature, pilot burner ignition will occur and, after an interval to prove pilot flame, main burners will ignite).

TO SHUT DOWN:

1. Turn "off" electric power to unit.
2. Depress knob of gas valve while turning to "off" position.

POST-START CHECK LIST (GAS)

After the entire control circuit has been energized and the heating section is operating, make the following checks:

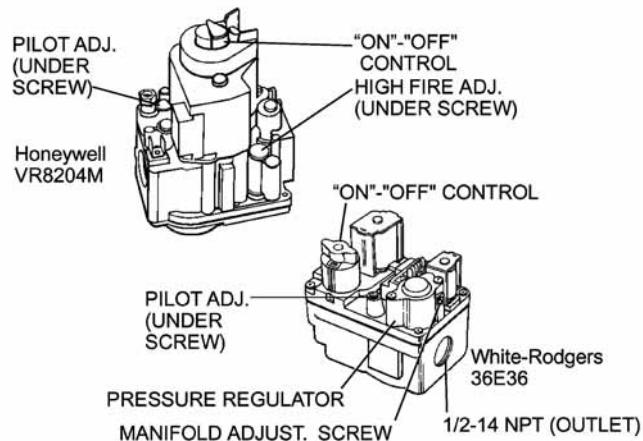
1. Check for gas leaks in the unit piping as well as the supply piping.

WARNING**FIRE OR EXPLOSION HAZARD**

Failure to follow the safety warning exactly could result in serious injury, death or property damage.

Never test for gas leaks with an open flame. use a commercially available soap solution made specifically for the detection of leaks to check all connections. A fire or explosion may result causing property damage, personal injury or loss of life.

2. Check for correct manifold gas pressures. See "Checking Gas Input" on page 69.
3. Check the supply gas pressure. It must be within the limits shown on rating nameplate. Supply pressure should be checked with all gas appliances in the building at full fire. At no time should the standby gas line pressure exceed 13", nor the operating pressure drop below 5.0" for natural gas units. If gas pressure is outside these limits, contact the local gas utility for corrective action.

**FIGURE 19 - TYPICAL GAS VALVES**

MANIFOLD GAS PRESSURE ADJUSTMENT

Small adjustments to the high-fire gas flow may be made by turning the pressure regulator adjusting screw on the automatic gas valve.

Adjust as follows:

1. Remove the cap on the regulator. It's located next to the push-on electrical terminals.
2. To decrease the gas pressure, turn the adjusting screw counterclockwise.
3. To increase the gas pressure, turn the adjusting screw clockwise.

NOTE: The correct manifold pressure for these furnaces is 3.50 IWG ± 0.3 .

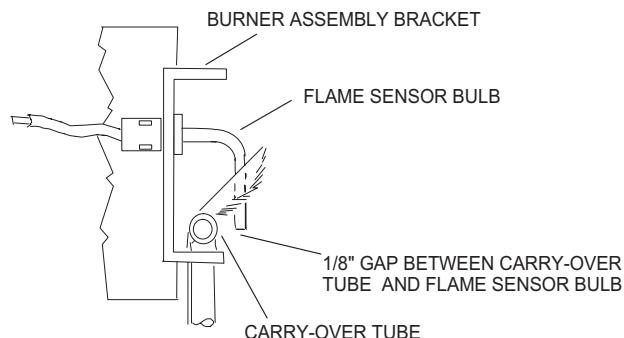


FIGURE 20 - PROPER FLAME ADJUSTMENT

PILOT CHECKOUT

The pilot flame should envelope the end of the flame sensor. To adjust pilot flame, (1) remove pilot adjustment cover screw, (2) increase or decrease the clearance for air to the desired level, (3) be sure to replace cover screw after adjustment to prevent possible gas leakage.

Put the system into operation and observe through complete cycle to be sure all controls function properly.

BURNER INSTRUCTIONS

To check or change burners, pilot or orifices, CLOSE MAIN MANUAL SHUT-OFF VALVE AND SHUT OFF ALL ELECTRIC POWER TO THE UNIT.

1. Remove the screws holding either end of the manifold to the burner supports.

2. Open the union fitting in the gas supply line just upstream of the unit gas valve and downstream from the main manual shut-off valve.
3. Remove the gas piping closure panel.
4. Disconnect wiring to the gas valves and spark ignitors. Remove the manifold-burner gas valve assembly by lifting up and pulling back.

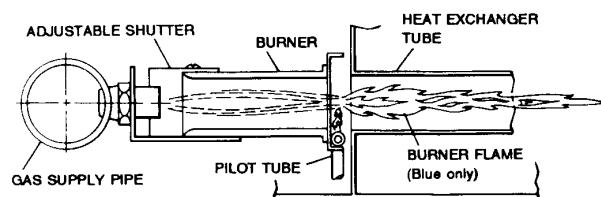


FIGURE 21 - TYPICAL FLAME APPEARANCE

Burners are now accessible for service.

Reverse the above procedure to replace the assemblies. Make sure that burners are level and seat at the rear of the heat exchanger.

BURNER AIR SHUTTER ADJUSTMENT

Adjust burner shutters so no yellow flame is observed in the heat exchanger tubes.

CHECKING GAS INPUT

NATURAL GAS

1. Turn off all other gas appliances connected to the gas meter.
2. With the furnace turned on, measure the time needed for one revolution of the hand on the smallest dial on the meter. A typical gas meter usually has a 1/2 or a 1 cubic foot test dial.
3. Using the number of seconds for each revolution and the size of the test dial increment, find the cubic feet of gas consumed per hour from the Gas Rate - Cubic Feet Per Hour (Table 54).

If the actual input is not within 5% of the furnace rating (with allowance being made for the permissible range of the regulator setting), replace the orifice spuds with spuds of the proper size.

NOTE: To find the Btu input, multiply the number of cubic feet of gas consumed per hour by the Btu content of the gas in your particular locality (contact your gas company for this information - it varies widely from city to city.)

TABLE 54: GAS RATE - CUBIC FEET PER HOUR¹

Seconds for one rev.	Size of Test Dial	
	1/2 cu. ft.	1 cu. ft.
10	180	360
12	150	300
14	129	257
16	113	225
18	100	200
20	90	180
22	82	164
24	75	150
26	69	138
28	64	129
30	60	120
32	56	113
34	53	106
36	50	100
38	47	95
40	45	90
42	43	86
44	41	82
46	39	78
48	37	75
50	36	72
52	35	69
54	34	67
56	32	64
58	31	62
60	30	60

1. By actual measurement, it takes 38 seconds for the hand on the 1-cubic foot dial to make a revolution with a 100,000 Btuh furnace running. Using this information, located 38 seconds in the first column in the table above. Read across to the column headed "1 Cubic Foot", where you will see that 95 cubic feet of gas per hour are consumed by the furnace at that rate. Multiply 95 X 1050 (the Btu rating of the gas obtained from the local gas company). The result is 99,750 Btuh, which is close to the 100,000 Btuh rating of the furnace.

ADJUSTMENT OF TEMPERATURE RISE

The temperature rise (or temperature difference between the return air and the heated air from the furnace) must lie within the range shown on the rating plate and the data in the Gas Heat Application Table 4.

$$CFM = \frac{Btuh \text{ Input} \times 0.8}{108 \times ^\circ F \text{ Temp. Rise}}$$

After the temperature rise has been determined, the cfm can be calculated as follows:

After about 20 minutes of operation, determine the furnace temperature rise. Take readings of both the return air and the heated air in the ducts (about six feet from the furnace) where they will not be affected by radiant heat. Increase the blower cfm to decrease the temperature rise; decrease the blower cfm to increase the rise. Refer to the Blower Motor and Drive Data Table 48.

TROUBLESHOOTING

COOLING TROUBLESHOOTING GUIDE

WARNING

Troubleshooting of components may require opening the electrical control box with the power connected to the unit. **Use extreme care when working with live circuits!** Check the unit nameplate for the correct line voltage and set the voltmeter to the correct range before making any connections with line terminals.

Shut off all electric power to the unit prior to any of the following maintenance procedures to prevent personal injury.

▲ CAUTION

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation, which could cause injury to person and/or damage unit components. Verify proper operation after servicing.

On calls for cooling, if the compressors are operating but the supply air blower motor does not energize after a short delay (the room thermostat fan switch is in the "AUTO" position).

1. Turn the thermostat fan switch to the ON position. If the supply air blower motor does not energize, go to Step 3.
2. If the blower motor runs with the fan switch in the ON position but will not run after the compressor has energized when the fan switch is in the AUTO position, check the room thermostat for contact between R and G in the AUTO position during calls for cooling.
3. If the supply air blower motor does not energize when the fan switch is set to ON, check that line voltage is being supplied to the contacts of the M2, contactor, and that the contactor is pulled in. Check for loose wiring between the contactor and the supply air blower motor.
4. If M2 is pulled in and voltage is supplied to M2, lightly touch the supply air blower motor housing. If it is hot, the motor may be off on internal protection. Cancel any thermostat calls and set the fan switch to AUTO. Wait for the internal overload to reset. Test again when cool.
5. If M2 is not pulled in, check for 24 volts at the M2 coil. If 24 volts are present at M2 but M2 is not pulled in, replace the contactor.
6. Failing the above, if there is line voltage supplied at M2, M2 is pulled in, and the supply air blower motor still does not operate, replace the motor.
7. If 24 volts is not present at M2, check that 24 volts is present at the UCB supply air blower motor terminal, "FAN". If 24 volts is present at the FAN, check for loose wiring between the UCB and M2.

8. If 24 volts is not present at the "FAN" terminal, check for 24 volts from the room thermostat. If 24 volts are not present from the room thermostat, check for the following:

- a. Proper operation of the room thermostat (contact between R and G with the fan switch in the ON position and in the AUTO position during operation calls).
- b. Proper wiring between the room thermostat and the UCB.
- c. Loose wiring from the room thermostat to the UCB.

9. If 24 volts is present at the room thermostat but not at the UCB, check for proper wiring between the thermostat and the UCB, i.e. that the thermostat G terminal is connected to the G terminal of the UCB, and for loose wiring.

10. If the thermostat and UCB are properly wired, replace the UCB.

On a call for cooling, the supply air blower motor is operating but the compressor is not (the room thermostat fan switch is in the "AUTO" position).

1. If installed, check the position of the economizer blades. If the blades are open, the economizer is providing free cooling and the compressors will not immediately operate. If both stages of cooling are requested simultaneously and the economizer provides free cooling, following a short delay the compressor will be energized unless it is locked out, unless this option has been disabled through computer communications.
2. If no economizer is installed or the economizer is not opening to provide free cooling and the compressor does not energize on a call for cooling, check for line voltage at the compressor contactor, M1, and that the contactor is pulled in. Check for loose wiring between the contactor and the compressor.
3. If M1 is pulled in and voltage is supplied at M1, lightly touch the compressor housing. If it is hot, the compressor may be off on inherent protection. Cancel any calls for cooling and wait for the internal overload to reset. Test again when cool.
4. If M1 is not pulled in, check for 24 volts at the M1 coil. If 24 volts are present and M1 is not pulled in, replace the contactor.

5. Failing the above, if voltage is supplied at M1, M1 is pulled in, and the compressor still does not operate, replace the compressor.
6. If 24 volts is not present at M1, check for 24 volts at the UCB terminal, C1. If 24 volts is present, check for loose wiring between C1 and the compressor contactor.
7. If 24 volts is not present at the C1 terminal, check for 24 volts from the room thermostat at the UCB Y1 terminal. If 24 volts is not present from the room thermostat, check for the following:
 - a. 24 volts at the thermostat Y1 terminal
 - b. Proper wiring between the room thermostat and the UCB, i.e. Y1 to Y1, Y2 to Y2
 - c. Loose wiring from the room thermostat to the UCB.
8. If 24 volts is present at the UCB Y1 terminal, the compressor may be out due to an open high-pressure switch, low-pressure switch, or freezestat. Check for 24 volts at the HPS1, LPS1, and FS1 terminals of the UCB. If a switch has opened, there should be a voltage potential between the UCB terminals, e.g. if LPS1 has opened, there will be a 24-volt potential between the LPS1 terminals.
9. If 24 volts is present at the UCB Y1 terminal and none of the protection switches have opened, the UCB may have locked out the compressor for repeat trips. The UCB should be flashing an alarm code. If not, press and release the ALARMS button on the UCB. The UCB will flash the last five alarms on the LED. If the compressor is locked out, cancel any call for cooling. This will reset any compressor lock outs.
- NOTE:** While the above step will reset any lockouts, the compressor may be held off for the ASCD. See the next step.
10. If 24 volts is present at the UCB Y1 terminal and none of the switches are open and the compressor is not locked out, the UCB may have the compressor in an ASCD. Check the LED for an indication of an ASCD cycle. The ASCD should time out within 5 minutes. Press and release the TEST button to reset all ASCDs.
11. If 24 volts is present at the UCB Y1 terminal and the compressor is not out due to a protective switch trip, repeat trip lock out, or ASCD, the economizer terminals of the UCB may be improperly wired. Check for 24 volts at the Y1 "OUT" terminal of the UCB. If 24 volts is present, trace the wiring from Y1 "OUT" for incorrect wiring. If 24 volts is not present at the Y1 "OUT" terminal, the UCB must be replaced.
12. *For units without economizers:* If 24 volts is present at the Y1 OUT terminal, check for 24 volts at the Y1 "ECON" terminal. If 24 volts is not present, check for loose wiring from the Y1 "OUT" terminal to the Mate-N-Lock plug, the jumper in the Mate-N-Lock plug, and in the wiring from the Mate-N-Lock plug to the Y1 "ECON" terminal.
13. *For units with economizers:* If 24 volts is present at the Y1 "OUT" terminal, check for 24 volts at the Y1 "ECON" terminal. If 24 volts is not present, check for loose wiring from the Y1 "OUT" terminal to the Mate-N-Lock plug, a poor connection between the UCB and economizer Mate-N-Lock plugs, loose wiring from the Mate-N-Lock plug to the economizer, back to the Mate-N-Lock plug, and from the Mate-N-Lock plug to the Y1 "ECON" terminal. If nothing is found, the economizer actuator may have faulted and is failing to return the 24-volt "call" to the Y1 "ECON" terminal even though the economizer is not providing free cooling. To test, disconnect the Mate-N-Locks and jumper between the WHITE and YELLOW wires of the UCB's Mate-N-Lock plug. If the compressor energizes, there is a fault in the economizer wiring or actuator.
14. The UCB can be programmed to lock out compressor operation during free cooling and in low ambient conditions. These options are not enabled by default. Local distributors can test the UCB for this programming.
15. If none of the above correct the error, replace the UCB.

GAS HEAT TROUBLESHOOTING GUIDE**WARNING**

Troubleshooting of components may require opening the electrical control box with the power connected to the unit. **Use extreme care when working with live circuits!** Check the unit nameplate for the correct line voltage and set the voltmeter to the correct range before making any connections with line terminals.

When not necessary, shut off all electric power to the unit prior to any of the following maintenance procedures so as to prevent personal injury.

CAUTION

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation, which could cause injury to person and/or damage unit components. Verify proper operation after servicing.

NOTE: To find the Btu input, multiply the number of cubic feet of gas consumed per hour by the Btu content of the gas in your particular locality (contact your gas company for this information - it varies widely from city to city.).

WARNING

The furnace may shut down on a high temperature condition during the procedure. If this occurs, the UCB energize the supply air blower motor until the high temperature limit has reset. Caution should be used at all times as the supply air blower may energize regardless of the room thermostat fan switch position.

On calls for heating, the draft motor operates and the furnace lights but the supply air blower motor does not

energize after a short delay (the room thermostat fan switch is in "AUTO" position).

1. Place the thermostat fan switch in the "ON" position. If the supply air blower motor energizes, go to Step 10.
2. If the supply air blower motor does not energize when the fan switch is set to "ON," check that line voltage is being supplied to the contacts of the M2 contactor, and that the contactor is pulled in. Check for loose wiring between the contactor and the supply air blower motor.
3. If M2 is pulled in and voltage is supplied at M2, lightly touch the supply air blower motor housing. If it is hot, the motor may be off on inherent protection. Cancel any thermostat calls and set the fan switch to "AUTO", wait for the internal overload to reset. Test again when cool.
4. If M2 is not pulled in, check for 24 volts at the M2 coil. If 24 volts is present at M2 but M2 is not pulled in, replace the contactor.
5. Failing the above, if there is line voltage supplied at M2, M2 is pulled in, and the supply air blower motor still does not operate, replace the motor.
6. If 24 volts is not present at M2, check that 24 volts is present at the supply air blower motor terminal on the UCB. If 24 volts is present at the UCB terminal, check for loose wiring between the UCB and M2.
7. If 24 volts is not present at the UCB supply air blower motor terminal, check for 24 volts from the room thermostat. If 24 volts is not present from the room thermostat, check for the following:
 - a. Proper operation of the room thermostat (contact between R and G with the fan switch in the "ON" position and in the "AUTO" position during operation calls).
 - b. Proper wiring between the room thermostat and the UCB.
 - c. Loose wiring from the room thermostat to the UCB.
8. If 24 volts is present at the room thermostat but not at the UCB, check for proper wiring between the thermostat and the UCB, i.e. that the thermostat G terminal is connected to the G terminal of the UCB, and for loose wiring.

9. If the thermostat and UCB are properly wired, replace the UCB.
10. If the blower motor runs with the fan switch in the "ON" position but does not run shortly after the furnace has ignited when the fan switch is in the "AUTO" position, check the room thermostat for contact between R and G during "W1" calls.

On calls for heating, the supply air blower operates but the draft motor does not (the room thermostat fan switch is in the "AUTO" position).

1. The draft motor has inherent protection. If the motor shell is hot to the touch, wait for the internal overload to reset.
2. If the motor shell is cold with the room thermostat calling for heat, check if 24 volts is present at the room thermostat but not at the UCB, check for proper wiring between the thermostat and the UCB, i.e. that the thermostat "W1" terminal is connected to the "W1" terminal of the UCB, and for loose wiring.
3. Check if the Draft Motor Control (DMC) is not pulled in, check for 24 volts at the DMC terminals "G" and "C". If 24 volts is present, replace the DMC. If 24 volts is not present, check for a loose 24 volt connection back to terminal "H1" on the UCB.
4. Check if line voltage is present at the DMC terminals "COM" to "NO". If the line voltage is present replace the DMC. If line voltage is not present check voltage from terminal "L3" of M1 contactor to terminal "NO" on the DMC, if line voltage is present replace the draft motor.

The draft motor runs but the furnace does not light and the sparker does not spark.

1. The ignition control (IC) may be locked out due to either a flame roll out or 100% shut off. These safety features are described above. If lock-out has occurred, 24V must be removed from the ignition controls. This is done at the unit or by resetting the room thermostat. After resetting 24V, check for proper furnace operation. If lock-out continues to occur, locate the source of the problem and correct.
2. Check all 24 volt connections from the UCB to and in the gas heat section. Check low voltage connections to the relay (RW1) located in the control box.

3. If the furnace is hot, it may be out on an over-temperature condition, wait for limit reset.
4. If the furnace is cold, check for 24 volts at terminal "5" and "7" of RW1. If 24 volts is present, check the RW1 relay coil terminals "A" and "B". If 24 volts is found at the coil replace the RW1 relay.
5. If 24 volts is not present at terminals "5" and "7" and the RW1 relay coil is pulled in. Check for 24 volts from terminal "5" to "Ground" on the RW1 relay. 24 volts here indicates that the problem is in the (RS) Roll Out Switch, or the (CS) Centrifugal Switch.
6. With the draft motor running, check for 24 volts at terminal "TH" to "Ground" on the ignitor control (IC) where the red lead from the draft motor attaches. If 24 volts is not present, the centrifugal switch (CS) has not closed or has gone bad. Check the line voltage to the unit, if it is correct replace the draft motor. If line voltage is low call the power company.
7. If 24 volts is present at the ignitor control, check all control wiring at the ignitor control and the wire to the ignitor. Check that the ground wires from the ignitor control, the gas valves and pilot burners are all intact and making good electrical connection. Check to make sure that the ceramic insulator on the pilot ignitor or sensors is not broken or cracked, if all are intact, replace the ignition control IC.

The draft motor runs and the ignitor sparks at the pilot burner but the pilot does not ignite and a gas odor is not detected at the draft motor outlet.

1. Check to make sure gas is being supplied to the unit. Make sure that the gas pressure to the unit is within the proper limits as described in the "POST START CHECK LIST" on page 68 and that the pilot adjust screw is allowing some flow of gas as described in "PILOT CHECKOUT" on page 69.
2. Check all wiring between the ignitor control and the gas valve. Check to make sure the ground connections are intact.
3. If the wiring is intact, check for 24 volts across terminals "PV" and "GROUND" on the ignitor control. If 24 volts is not present, replace the ignitor control.
4. If 24 volts is present, remove the pilot burner and remove the pilot orifice from the pilot burner. The orifice is removed in the direction opposite the flow

of gas. Inspect the orifice for obstruction. If it is clear, replace the main gas valve.

The ignitor sparks at the pilot burner but the pilot does not ignite and a gas odor is detected at the draft motor outlet.

1. Adjust the pilot adjust screw on the gas valve as described in "PILOT CHECKOUT" on page 69.
2. Check the supply pressure as described in "POST START CHECK LIST" on page 68. Make adjustments as necessary.
3. Check the pilot orifice and carryover tube for obstruction as described in paragraph above. Clean as needed but the problem should not be the gas valve.

The pilot burner ignites but the ignitor continues to spark and the main burners do not ignite.

1. Make the same checks and adjustment as described in "PILOT CHECKOUT" on page 69.
2. Check the supply pressure as described in "POST START CHECK LIST" on page 68. Make adjustments as necessary.
3. Make sure that the pilot burner is not bent or damaged.
4. Make sure that the ground connections at the pilot burner, gas valve and ignitor control are intact. Check the ignitor wire for good electrical connection. If all are intact, replace the ignitor module.

The pilot burner lights and the spark stops but the main burners do not light.

1. Check electrical connections between the ignitor control and the gas valve. If intact, check for 24 volts across terminals "MV" and "GROUND" terminals. If no voltage detected, replace ignitor control. If voltage is present, replace gas valve.

Furnace lights with roll-out or one burner has delayed ignition.

1. Make sure that the carryover is aligned properly with the flame sensor as described in "PILOT CHECKOUT" on page 69.

Main burners light but exhibit erratic flame characteristics.

1. Adjust air shutters as described in "BURNER AIR SHUTTER ADJUSTMENT" on page 69.
2. Check the main burner orifices for obstruction and alignment. Removal procedure is described in BURNER INSTRUCTIONS on page 69. Clean or replace burner orifices and burners as needed.

UNIT FLASH CODES

Various flash codes are utilized by the unit control board (UCB) to aid in troubleshooting. Flash codes are distinguished by the short on and off cycle used (approximately 200ms on and 200ms off). To show normal operation, the control board flashes a 1 second on, 1 second off "heartbeat" during normal operation. This is to verify that the UCB is functioning correctly. Do not confuse this with an error flash code. To prevent confusion, a 1-flash, flash code is not used.

Current alarms or active restrictions are flashed on the UCB LED. Pressing and releasing the ALARMS button on the UCB can check the alarm history. The UCB will cycle through the last five (5) alarms, most recent to oldest, separating each alarm flash code by approximately 2 seconds.

In some cases, it may be necessary to "zero" the ASCD for the compressors in order to perform troubleshooting. To reset all ASCDs for one cycle, press and release the UCB TEST button once.

TABLE 55: UNIT CONTROL BOARD FLASH CODES

Flash Code	Description
On Steady	Control Failure - Replace Control
Heart Beat	Normal Operation
1 Flash	Not Applicable
2 Flashes	Control waiting ASCD ¹
3 Flashes	HPS1 - Compressor Lock out
4 Flashes	HPS2 - Compressor Lock out
5 Flashes	LPS1 - Compressor Lock out
6 Flashes	LPS2 - Compressor Lock out
7 Flashes	FS1 - Compressor Lock out
8 Flashes	FS2 - Compressor Lock out
9 Flashes	Ignition Control Locked Out/ Ignition Control Failure / Limit Switch Trip / No Jumper Plug in Heat Section
10 Flashes	Compressors Locked Out On Low Outdoor Air Temperature ¹
11 Flashes	Compressors Locked Out Because The Economizer Is Using Free Cooling ¹
12 Flashes	Fan Overload Switch Trip
13 Flashes	Compressor Held Off Due To Low Voltage ¹
14 Flashes	EEPROM Storage Failure (Control Failure)
OFF	No Power or Control Failure

1. These flash codes do not represent alarms.